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JANUARY, 1890.

INCOMPATIBILITY IN PRESCRIPTIONS.

By Joseph W. England, Ph.G.

Read at the Pharmaceutical Meeting, December 17th.

Incompatibility in a prescription has been defined as that condition in which there exists either "a chemical decomposition, a pharmaceutical dissociation, or a therapeutical opposition" of its constituents. The term is thus susceptible of three meanings. A prescription is chemically incompatible, where chemical change results. It is pharmaceutically incompatible where there is violation of correct pharmaceutical procedure, and there is therapeutical incompatibility where there is antagonism in physiological action. Now, accepting these definitions, a prescription may be chemically incompatible and yet be just what the physician wants. It may be pharmaceutically incompatible and yet be desirable for the same reason. But it is never compatible where there is a change of chemical composition and pharmaceutical character resulting in the formation of new products having totally different therapeutical effects than those obviously intended. And this view—the intended therapeutical action of the prescription—is the "keystone of the arch" and the best rule for the pharmacist to follow.

Every new prescription is largely a law unto itself until tried. Expertness in pharmaceutical manipulation, of which prescription work is the highest type, is a matter of individual ability which can be acquired, only in the largest and best measure, by personal experience. The subject of incompatibles is not a formidable one, if there primarily exists a clear knowledge of the chemical or pharmaceutical properties of the substances used, so that any deviation from the right standard may be detected, but here is the puzzling question: How are

we to know but that, in the event of some chemical or pharmaceutical change, the physician does not mean just such a change, and nothing else?

At first glance it seems strange, but there are some most successful physicians who, every now and then, write, pharmaceutically and chemically, the most incompatible prescriptions. Yet they have success. And their happy results can only be due to the formation of certain new products or an alteration in pharmaceutical character of old ones. It does not follow that all prescriptions thus written are of the highest therapeutical value. Far from it. The tendency of the times is steadily in the direction of greater simplicity in prescription writing.

It is to be regretted that the physician seems to depend in large measure upon the pharmacist for detecting any chemical or pharmaceutical incompatibility, and that the pharmacist depends, solely and alone, upon the physician for recognizing any therapeutical incompatibility. A physician with his many duties cannot be expected to have at his command the vast detail of pharmaceutical facts, nor can the pharmacist be considered negligent in not possessing an extended acquaintance with the application of drugs in medicine; but it is clear that some elementary knowledge as to how drugs act and for what purposes they may be employed would be of great practical value to the pharmacist in affording him a clear idea of the therapeutical intent of the prescriber, and the ability to detect any deviation through a chemical or pharmaceutical error. An argument for therapeutical knowledge is not a step in the direction of counter-prescribing. It is only a plea for broader education—for elementary therapeutics on distinctly pharmaceutical lines. With therapeutics, pure and simple, the pharmacist has nothing whatever to do. That is solely the province of the physician. Medicine and pharmacy are making rapid scientific progress, not in the same way, though co-laborers in the same cause, but upon certain definite lines of work and study, yearly becoming more distinct and widely separated, rendering each the more dependent on the other.

Concerning special instances of incompatibility, the writer, some time ago, devised a set of "notes," and they have been found of such good service, though doubtless much of the subject matter has been duplicated in your own personal experiences, that he feels impelled to present them in their entirety.

An important feature about which there seems to be some difficulty in remembering is the solubilities and insolubilities of inorganic compounds. To make such knowledge readily accessible, a modified table was framed, based almost wholly upon Prof. Attfield's "Statement of the Solubilities and Insolubilities of Salts," which expresses, directly or by inference, nearly 500 soluble and insoluble compounds of the following inorganic basylous radicals: aluminium, ammonium, antimony, barium, bismuth, cadmium, calcium, chromium, cobalt, copper, ferric, ferrous, gold, lead, lithium, magnesium, manganese, mercuric, mercurous, nickel, potassium, silver, sodium, stannic, stannous, strontium and zinc.

In using this table, it is only needful to remember the well-known chemical law: that when a solution of a compound is brought in contact with a solution of another compound, and, by an interchange of radicals, an insoluble compound is rendered possible, that compound will be precipitated.

Acetates are soluble.

Arseniates are insoluble, except those of the alkali metals.

Arsenites are insoluble, except those of the alkali metals.

Bromides are soluble, except mercurous and silver; those of antimony and bismuth are decomposed by water to form oxysalts.

Carbonates are insoluble, except those of the alkali metals.

Chlorides are soluble, except those of lead (*s*), mercurous and silver.

Citrates are soluble, except those of manganese, mercurous, silver and strontium, aluminium (*s*), barium (*s*), bismuth (*s*), cadmium (*s*), calcium (*s*), lead (*s*), zinc (*s*).

Cyanides are insoluble, except the mercuric and those of the alkaline metals and earths.

Hydrates are insoluble, except those of barium, strontium, calcium (*s*) and lead (*s*) and the alkali metals.

Iodides are soluble, except those of antimony, bismuth, gold, lead (*s*), mercuric, mercurous, platinum (*s*) and silver.

Nitrates are soluble.

Oxalates are insoluble, except those of antimony (*s*), chromium, ferric (*s*), ferrous (*s*), stannic, and the alkali metals.

Oxides are insoluble, except those of barium, strontium, calcium (*s*), and the alkaline metals.

(*s*) means sparingly soluble.

Phosphates (ortho) are insoluble, except those of the alkali metals.

Sulphates are soluble, except those of barium, strontium, calcium (*s*), antimony, lead, mercurous (*s*) and silver (*s*).

Sulphides are insoluble, except those of barium, calcium (*s*), strontium, and the alkali metals.

Sulphites are soluble, except those of aluminium, antimony, barium, bismuth, calcium (*s*), cobalt (*s*), copper, ferrous (*s*), lead, manganese (*s*), nickel (*s*), silver, stannous, strontium and zinc (*s*).

Tartrates are soluble, except those of antimony, barium, bismuth, cadmium (*s*), calcium (*s*), copper (*s*), ferrous (*s*), lead, manganese (*s*), mercuric, mercurous, nickel (*s*), silver, strontium (*s*) and zinc (*s*).

Acids decompose hydrates, carbonates and acid carbonates to form salts; the stronger acids, which are largely inorganic, set free the weaker acids, which are largely organic, or, brought in contact with alcohol or alcoholic solutions, form ethers; alkaline hydrates, carbonates and acid carbonates neutralize free acids, decompose some glucosides and precipitate all alkaloids, some of which precipitates are soluble in excess of the precipitant, or in alcohol, if that liquid be present in sufficient amount to dissolve them.

Oxidizing agents such as nitric, hydrochloric, nitro-hydrochloric, picric and chromic acids, and potassium bichromate and permanganate, with readily oxidizable substances, such as carbohydrates, alcohols, ethers, sulphur, phosphorus, sulphides, and organic matter in general, form explosive compounds. Potassium permanganate, if ordered in pill form, can best be made with cacao butter, and cosmoline in very small quantity, and enclosed in gelatin capsules. Silver nitrate is reduced by organic matter to oxide, with the exception, it is said, of opium and extract of hyoscyamus. A very good way of making pills of it is with cacao butter and cosmoline, etc., as mentioned above, under potassium permanganate; syrup of ferrous iodide and potassium chlorate form a poisonous compound, and potassium iodide and potassium chlorate form a mixture which yields the poisonous iodate on being taken internally.[1]

Iodine and the iodides yield precipitates with the alkaloids; bromides precipitate morphine and strychnine salts on standing, but a few drops of dilute hydrochloric acid added, after the addition of the alkaloid, prevents the change. Sodium biborate precipitates mor-

(*s*) means sparingly soluble.

[1] Am. Jour. Phar., 1876, p. 277.

phine and cocaine salts, but on the addition of a small quantity of boric acid, or with boric acid alone, precipitation does not take place. Mercuric chloride with acidulated solutions of the alkaloids forms crystalline double salts; potassium-mercuric iodide precipitates alkaloidal solutions. Solutions of quinine salts with those of the alkaline acetates, or with Basham's mixture, precipitate the sparingly soluble quinine acetate. Morphine solutions give the phenol reaction, if mixed with tincture of ferric chloride.

Glucosides are decomposed by free acids and precipitated by tannin; tannic and gallic acids precipitate alkaloids, albumen, gelatin and the majority of metallic salts, and yield inks with iron solutions.

Resinous tinctures and fluid extracts, prescribed with aqueous solutions, should always be emulsified with acacia; tinctures and fluid extracts made of stronger alcohol, mixed with those made of diluted alcohol, become turbid and precipitate, since the special solvent power of alcohol, or of water, for a substance diminishes in proportion to the quantity of the other liquid present. A "shake" label should always be used.

When for internal use, fixed and volatile oils and oleo-resins, and aqueous solutions, should always be emulsified, whether ordered or not, and, to better emulsify the volatile oils, they should have mixed with them, prior to emulsification, an equal volume of olive, almond or cottonseed oil.

Tincture of ferric chloride gelatinizes mucilage of acacia; free acids separate insoluble carminic acids from compound tincture of cardamom; free acids precipitate glycyrrhizin from fluid extract of licorice.

Commercial spirits of nitrous ether liberates iodine from solutions of iodides, decomposes antipyrine solutions to form a green nitro-derivative, and precipitates mucilage of acacia, but if it be well diluted with water it can usually be added last without precipitating. Tincture of guaiac and spirits of nitrous ether are stated to be pharmaceutically incompatible by Potter (although they are often prescribed together), likewise infusion of wild cherry with compound infusion of gentian, infusion of cinchona with compound infusion of gentian, and infusions with metallic salts generally.

Sodium salicylate in solution precipitates the sparingly soluble salicylic acid if mixed with acids, and yields, if dispensed in powders with potassium acetate, the very deliquescent potassium salicylate. Sodium salicylate in strong solution is decomposed by tincture of ferric

chloride, but if well diluted first changes only into ferric salicylate. Sodium benzoate solution is decomposed by acids to yield the sparingly soluble benzoic acid.

Mercuric chloride is decomposed by solution of potassium arsenite, but if the alkaline solution has first added to it, in slight excess, diluted hydrochloric acid no precipitation will take place on the addition of the mercurial salt; pyrophosphate and phosphate of iron solutions precipitate with dilute phosphoric acid. The National Formulary recommends the usage of dilute metaphosphoric acid, in place of the officinal "ortho" variety, as yielding a permanently clear solution.

In conclusion, the writer would say that in these "notes" presented he has endeavored to give, not an exhaustive list of special incompatibles, but simply a general expression of those liable to occur in the every-day routine of prescription work.

What to do with an incompatible prescription is a question for individual judgment and cannot here be entered into. The usual practice, in the event that the prescription involves no serious change, is to accept the situation and dispense as written. On the other hand, where some serious change is liable to take place, it is almost superfluous to state that it is the duty of the pharmacist to consult the physician before dispensing.

THE PURIFICATION OF BENZIN FOR PHARMACEUTICAL AND CHEMICAL PURPOSES.

By George M. Beringer, Ph. G.

Read at the Pharmaceutical Meeting December 17, 1889.

The U. S. Pharmacopœia of 1880 introduced benzin, describing it as a purified distillate from American petroleum, consisting of hydrocarbons chiefly of the marsh gas series and homologous compounds, having a sp. gr. from 0·670 to 0·675 and boiling at 50° to 60° C. (122° to 140°F.). It is required to be free from heavy hydrocarbons, pyrogenous products and sulphur compounds.

The British Pharmacopœia requires a boiling point of 50° to 60°C. (122° to 140°F.), but allows a much wider range of gravity, viz.:— 0·670 to 0·700.

The German Pharmacopœia describes benzin as a colorless nonfluorescent fractional distillate of petroleum of the sp. gr. 0·640 to 0·670, distilling over almost completely between 55° to 75°C.

The U. S. Pharmacopœia, by limiting the product to a sp. gr. of

0·670 to 0·675, admits of but a very small portion of the distillate, corresponding to a commercial benzin of 78°B. being used. It is safe to say that none of the commercial so-called deodorized benzins, and but very little of the petroleum ether sold for chemical purposes, answer the pharmacopœial requirements. What is generally supplied the pharmacist, when he orders benzin, is a distillate of 65°B. (sp. gr. 0·717) or, frequently, even as high a gravity as 62°B. (sp. gr. 0·729) is supplied. If he is somewhat particular, he may procure 75° B. (sp. gr. 0·680), but benzins from 75°B. to 90°B. are generally supplied as gasoline. Every sample of commercial deodorized benzin that I have been able to procure, has been so contaminated with pyrogenous and sulphurous impurities as to be totally unfit for pharmaceutical purposes, and the petroleum ethers, while cheap enough to be used as solvents in chemical analysis are too expensive for pharmaceutical use.

The solvent properties of benzin render it a valuable agent in the laboratory and I have no doubt that, in the near future, it will be used in many of the processes of pharmacy, such as the preparation of plasters, the extraction of fats and oils from certain drugs before percolation, such as nux vomica, ergot and strophanthus, or of caoutchouc-like substances from others such as lactucarium.

A process by which the pharmacist can easily, safely and cheaply purify benzin seems to me to be a desirderatum. It was surmised that the sulphur compounds could be removed by oxidation with potassium permanganate. As the result of experiments the following process was devised.

Take of Potassium permanganate.....one ounce avoir.
Sulphuric acid.....a half pint.
Water.....three and a half pints.

Mix the acid and water and when the mixture has become cold, pour it into a two-gallon bottle. Add the permanganate and agitate until it is dissolved. Then add

Benzin.....one gallon.

and thoroughly agitate. Allow the liquid to remain in contact for 24 hours, frequently agitating the mixture. Separate the benzin and wash in a similar bottle with a mixture of

Potassium permanganate.....¼oz avoir.
Soda.....½oz. avoir.
Water.....2 pints.

Agitate the mixture frequently during several hours. Then separate the benzin and wash it thoroughly with water.

On agitating the benzin with the acid permanganate solution, an emulsion-like mixture is produced which separates in a few seconds, the permanganate solution slowly subsiding and showing considerable reduction. The time specified (24 hours) is greatly in excess of what is necessary, as the reduction takes place almost entirely in a very short time, and I have no doubt that if the process were adopted on the manufacturing scale, with mechanical agitators, the time could be reduced to an hour or two.

The quantity of permanganate necessary is in direct proportion to the impurities existing in the benzin. The quantity ordered in the formula is sufficient for a pretty foul benzin and may be reduced with a purer distillate.

The samples shown were samples of commercial 75° and 88° gasoline which, as received from the refinery, were anything but sweet. The 75° showed a sp. gr. of 0·6845, and, after being thus purified, the sp. gr. remained the same. On evaporating from the hand, it left no disagreeable odor, and 50 cc. eveporated entirely in a platinum dish below 70° C. (158° F.), leaving no residue. When tested for sulphur compounds, by boiling with ammoniacal alcohol and then adding silver nitrate solution, it gave negative results. Shaken with warm distilled water and the water, separated, tested with $BaCl_2$ for sulphates, gave no reaction.

The sample of 88°, when received from the refinery, was exceedingly rank, as you will perceive from the sample shown. It seems that the lighter the benzin the more it is contaminated with sulphur compounds. It showed a sp. gr. of 0·6476. After treating as described, its sp. gr. was 0·6484. On evaporation from the hand, it had a peculiar almost ethereal, but not disagreeable odor. 50 cc. evaporated from a platinum dish entirely below 50° C., leaving no residue and, when tested for sulphur compounds and sulphates, as described, gave negative results.

For the preparation of petroleum ether for plant analysis, etc., where an exceptionally fine article is desired, it is only necessary to rectify this last purified article by fractional distillation from lard or other fatty substance, as recommended by Dragendorff, collecting only that portion which distils below 45° C.

Sample No. 5 has been thus prepared and shows sp. gr. of 0·641 and is exceedingly volatile and devoid of odor.

THE OILS OF WINTERGREEN AND BIRCH.

By Henry Trimble and Hermann J. M. Schroeter.

Contribution from the Chemical Laboratory of the Philadelphia College of Pharmacy, No. 64.

Read at the Pharmaceutical Meeting December 17th.

Under the above title we published in this Journal for August, 1889, page 398, a paper which has recently been criticized at considerable length by Prof. F. B. Power in the *Phar. Rundsch.*, of New York, December, 1889. This critic states that "good and sufficient reasons might be presented for inferring *a priori* the incorrectness of many of their [our] statements," and with this preliminary bias he proceeds to substantiate his belief by examining a sample of (1) oil of wintergreen, (2) oil of birch which, however, he claims was adulterated, and (3) "synthetic oil of wintergreen," furnished him by the agents of the manufacturers.

We proposed a new method for separating the hydrocarbon from the above natural oils by agitating the saponified mixture with ether or petroleum ether. Prof. Power is unable to get results agreeing with ours; he, however, now finds that the hydrocarbon is a viscid liquid, a fact he had not previously noted until we found it to solidify at about 10° C., but he will not admit that we determined its vapor density, because in his fruitless efforts to carry out the same process he found it decomposed at the temperatures of 300°, 360° C. (!!) and over, which he employed.

We suggest to him that no one but a novice would think of taking the vapor density of such an easily decomposable substance at from 100° to 200° above its boiling point. We, therefore, feel justified in endorsing his language and saying that *his* efforts "possess no scientific value."

We saponified our oils at the temperature of a water-bath in one-half hour, and are of the opinion that a lower temperature and shorter time will accomplish the purpose. Mr. H. P. Pettigrew[1] boiled the oils he investigated for six hours with a concentrated solution of potassium hydrate. Is it remarkable that he did not find a hydrocarbon in oil of birch? During such an ordeal it was either decomposed or escaped condensation. Since Prof. Power has repeatedly called attention to the fact that Mr. Pettigrew's experiments were con-

[1] Amer. Jour. of Pharm., 1883, p. 386.

ducted under his direction, it would be a matter of interest to know why he suggested such unreasonable treatment, and why he now boils the mixture for only two hours. He might also explain why he allowed Mr. Pettigrew in the same investigation to record the specific gravity of 1·0318 for oil of wintergreen at 22° C.

Prof. Power's experience with oil of birch narrows down to the investigation of Mr. Pettigrew, and more recently his own on what he claims was an adulterated sample, which adulteration, if true, would certainly render his results worse than useless. In view of the above it is not surprising that he failed to find benzoic acid in the natural oils, and his method of attempting to throw doubt on the occurrence of ethyl alcohol in the oils, by vague statements about oil of turpentine producing the iodoform reaction, is simply pitiable. Right here, therefore, we may say with emphasis that such reasoning at the writing table will not take the place of figures obtained in the laboratory.

In regard to the third sample examined by Prof. Power, which he designates "synthetic oil of wintergreen," we suggest that it would have been more in accordance with *his* results, had he named it "synthetic oil of birch." It would have been more scientific had he procured his sample in the open market as we did. In reply to the elaborate reasoning by which he attempted to show that our sample could not have contained benzoate of methyl, we answer that we purposely said nothing about benzoate of methyl, but merely stated that benzoic acid was present in the sample of artificial oil examined by us. It is our opinion that it was a mixture of methyl salicylate, ethyl salicylate and ethyl benzoate. Such a product could easily be made to conform with the specific gravity and boiling point given. As the artificial oil was of secondary importance in our work, we did not attempt to investigate the alcohol, and therefore merely stated that we found benzoic acid.

Finally in his summary Prof. Power flatly contradicts himself when he asserts that the artificial cannot be distinguished from the natural oil by adding an "excess of potassium hydrate" as stated by us. He says "on heating either of these oils," that is, the natural or artificial product, "with a caustic alkali the wintergreen odor is naturally destroyed since the chemical compound to which the odor is due becomes thereby decomposed." It is true that the methyl salicylate is decomposed and *its* odor disappears, but what becomes of the hydrocarbon? We admit that the latter might be, and probably is decom-

posed, by boiling with concentrated alkali for six or even two hours, but every one who has prepared the acid from natural oil of wintergreen or birch knows the difficulty attending the separation of the acid from the persistent odor of the hydrocarbon.

We consider this a cardinal point, and, therefore, we have shown at a pharmaceutical meeting in the Philadelphia College of Pharmacy that the natural oils retain a pleasant odor after warming with a concentrated solution of potassium hydrate in a test tube, while the artificial oil, of which we showed three different samples, loses all agreable odor almost immediately on the addition of the same reagent.

In conclusion we hope the Pharmacopœia Committee will in no way recognize the artificial product, since if we accept Prof. Power's statement it is manufactured almost exclusively by one firm.

The Pharmacopœia is published for the physician and pharmacist, and it will be ample time to recognize the artificial oil when physicians commence to designate it in their prescriptions, which is not likely to be the case as long as they write for salicylic acid from the natural oil.

With this we close our notice of any further remarks by others unless such criticisms are accompanied by evidence of more elaborate laboratory work.

CHEMICAL NOTES.

By Henry C. C. Maisch, Ph. G., Ph. D.

Examination of two species of Polygala.—L. Reuter (meeting of scientists and physicians, Heidelberg, through *Pharm. Centralh.*, 1889, p. 609) obtained from the root of *Polygala alba* senegin, 1·067 per cent.; resin, 0·85 per cent.; fatty oil, 0·2 per cent.; methyl salicylate, a trace. A Japanese senega (according to Shimoyama, possibly *P. tenuifolia*), yielded 9·6 per cent. of a brownish-yellow mass, which consisted of 0·8 per cent. resin and 8·8 per cent. oil methyl salicylate as above, the odor, however, resembled patchouly.

Constituents of Urtica urens and U. dioica.—The same author (*l. c.*) extracted from the powdered leaves after treatment with slaked lime and water and evaporating a glucoside which was free from nitrogen and gave precipitates with the following reagents: Iodo-iodide of potassium, potassio-mercuric iodide, platinum chloride, mercuric chloride, palladium chloride, phospho-tungstic acid. Potassium ferricy-

anide is reduced, as is also potassium chromate in presence of sulphuric acid. Tannin, sodium chloride, ammonia, sodium hydrate, sodium carbonate and bicarbonate have no effect. The aqueous solution is neutral.

From the seeds of *U. pilulifera*, which in the Orient are highly spoken of as a galactopœum, the same author (*l. c.*) extracted also a glucoside. The powdered seeds were treated with magnesia and water, the mixture evaporated to dryness and extracted with chloroform. He obtained an oil rich in chlorophyll. The residue from the above was extracted with absolute alcohol, the latter distilled off, and the remainder taken up with water. On acidifying this solution with hydrochloric acid it yielded with iodo-potassium iodide a copious precipitate. Its behavior towards Fehling's solution before and after treatment with acids showed it to be a glucoside.

Eschscholtzia californica, according to the same author (*l. c.*) contains two alkaloids and a glucoside. One of the alkaloids, *protopine*, which is widely distributed through the papaveraceæ, has, according to E. Schmidt (meeting of scientists and physicians, Heidelberg, through *Chem. Centralh.*, 1889, ii, p. 579), a physiological action similar to that of morphine. One of the alkaloids gives a violet color with sulphuric acid.

The root of *Berberis aquifolium* contains, according to E. Schmidt (*l.c.*) berberine, oxyacanthine, berbamine and phytosterin. He found the composition of berbamine and oxyacanthine to be $C_{18}H_{19}NO_3$. The purification of berberine is best accomplished by the following method: A salt of berberine is dissolved in water, acetone and sodium hydrate added, and after the liquid has cooled the crystalline acetone—berberine is collected and washed. The berberine salts are obtained by boiling the above compound with dilute acids, and the free alkaloid by heating with chloroform and alcohol; these solvents are distilled off, and after cooling the alkaloid is recrystallized from water. The alkaloid obtained differs in some respects from that prepared according to the older method (decomposition of the sulphate with barium hydrate, removing excess of barium with CO_2, evaporating in vacuo and recrystallizing), the latter giving off 6 mol. water at 100° C., the former only 4 mol.; the former further does not absorb CO_2, while the latter does, forming an acid carbonate.

According to the same author the root of *chelidonium* contains chelidonine, ($C_{20}H_{19}NO_5 + H_2O$), chelerythrine, and a number (about a dozen) of

other alkaloids. From the raw alkaloid of Merck he isolated three further alkaloids, α- and β-homochelidonine and protopine. The latter alkaloid has also been found in Sanguinaria canadensis (besides a number of others), Stylophorum and Eschscholtzia californica (previously taken for morphine in this plant). The chelidonium alkaloids resemble morphine in physiological action. The stylophorine, from the root of *Stylophorum diphyllum*, is identical with chelidonine.

Further, the above author reported some investigations on the mydriatic alkaloids. The length of keeping *belladonna root* has no effect on the alkaloid present, this being principally hyoscyamine. The time of collecting, however, has an influence, the first year's root containing hyoscyamine and atropine.

Scopolia atropoïdes and *Sc. japonica* contain hyoscyamine and hyoscine; the latter has been obtained in a crystalline form by C. J. Bender. Traces of a mydriatic alkaloid have been noticed in *Solanum tuberosum*, *S. nigrum* and *Lycium barbarum*.

Oil of Andropogon Nardus or *citronella oil.*—T. D. Dodge, *Am. Chem. Jour.*, 1889, p. 456. According to the preliminary notice the author obtains somewhat different results from Kremers (Proc. Am. Pharm. Assoc., 1887, p. 562). The aldehyde, isolated from the oil by means of a concentrated solution of sodium bisulphite, according to Kremers is $C_7H_{14}O$ while Dodge obtains results corresponding to $C_{10}H_{18}O$ and names the compound citronellic aldehyde. By the action of P_2O_5, an oily product, probably a terpene, was obtained. By heating the dibromide of the aldehyde the distillate contained a small quantity of oil having the odor of cymene, $C_{10}H_{14}$, thus confirming the statement of C. R. A. Wright (*Jour. Chem Soc.*, 1875, p. 1). Oxidation with potassium permanganate yielded a mixture of fatty acids smelling strongly of ordinary valerianic acid. A portion of the oil boiling at 77° C. is very likely a terpene. The portion boiling at 222° C. is probably citronellyl alcohol, $C_{10}H_{20}O$, the same as obtained by the reduction of citronellic aldehyde, the acetyl derivatives of both having the same characteristic odor. The oil is, according to this author, similar in composition to oil of tansy, examined by Bruylants (Amer. Jour. Phar., 1878, p. 254), who found an aldehyde, $C_{10}H_{16}O$, the corresponding alcohol, $C_{10}H_{18}O$, and a terpene.

Dextrorotary honey.—C. Amthor and J. Stern (*Zeitschr. f. angew. Chem.*, 1889, p. 575), examined two specimens of Alsatian honey, one

from Neuweiler im Steinthal, rotation +10·7° Laurent, and the other from Upper Alsatia, showing +10·26° Laurent in a 200 mm. tube. The rotation was due to a dextrin, of which the former contained 6·1209 per cent. the latter 9·03 per cent. Both honeys were natural products.

Olive Oils from various sources.—L. Archbutt (*Jour. of Soc. Chem. Industry*, vii, 1889, p. 685–686, through *Chem. Centralb.*, 1889, ii, p. 886) examined 70 Spanish oils, 10 of which were adulterated, the percentage of free, fatty acids varying from 25·1 per cent., the highest, to 1·5 per cent., the lowest, the average being 5·5 per cent. Of 29 Italian oils only one was adulterated. Fatty acids: highest, 25·2 per cent.; lowest, 0·9 per cent.; average, 8·5 per cent. Only 9 of 22 Sicilian oils were pure. Fatty acids: highest, 16·6 per cent; lowest, 0·5; average, 9·1 per cent.

Reactions of Oil of Sesame.—W. Bishop (*Jour. de Pharm. et de Chim.* (5), xxx (1889), p. 244–247) states that ol. sesame which has been exposed to air and sunlight for a few days gives a green color when shaken with hydrochloric acid 21–22° B. (sp. gr., 1·1670–1·1763). According to the author, 5–10 per cent. of sesame oil may be detected in olive oil by this method. The oil is exposed to the action of sunlight and air for a few days and then 6–8 cc. of the oil shaken with 12–14 cc. HCl of above strength in a stoppered flask holding about 35 cc.

Estimation of Morphine in Opium.—Prof. F. A. Flückiger (*Arch. d. Pharm.*, 1889, p. 721–732) estimates morphine in the following manner: 8 gm. of powdered opium are placed in a plaited filter 12 cm. in diameter, the funnel being slightly tapped in order to bring the powder to the bottom, and the whole dried at 100° C. After half an hour, a mixture of 10 cc. chloroform and 10 cc. ether is poured on the powder, the funnel being covered and tapped a number of times; then 10 cc. chloroform additional are poured on. After the liquid has drained off, the filter is spread out and the powder dried at a slightly elevated temperature. The powder is then shaken with 80 gm. water to which has been added 0·2 gm. ammonium oxalate to separate the calcium present, and filtered after two hours. 42·5 gm. of the filtrate are treated in a small tared flask with 7·5 cc. alcohol (sp. gr., 0·83), 15 cc. ether and 1 cc. ammonia (sp. gr. 0·96). After six hours, having shaken often, the contents of the flask are poured on two plaited filters, one inside of the other, and 10 cm. in diameter, the flask being rinsed with 10 cc. water or an aqueous solution of

morphine (1 : 5,000) and poured on the filters. These are dried at slightly elevated temperatures and at last at 100° C. The morphine is then transferred to the flask which has been dried at 100° C., and the whole heated to this temperature until constant. The morphine obtained represents one-half the quantity of the opium.

GLEANINGS FROM THE GERMAN JOURNALS.

By Frank X. Moerk, Ph. G.

Commercial Ether.—In an examination of the oxychlorides of mercury K. Thümmel attempted to remove by agitation with ether an excess of mercuric chloride from a solution of monoxychloride of mercury in sodium bicarbonate; but this was found to be impossible as the ethereal solution after some minutes became turbid and deposited a white precipitate. The elaborate researches made to ascertain the nature and source of this precipitate disclosed that all samples of ether, made by him or purchased, showed the same behavior and that this was due to the presence of *vinyl alcohol, which is a constant impurity of commercial ether.* The vinyl alcohol is formed in the manufacture of the ether and is the product of oxidation of pure ether by atmospheric oxygen with formation at the same time of hydrogen peroxide; it is also formed by the action of hydrogen peroxide, ozone and chromium trioxide upon ether. Vinyl alcohol may be removed from the ether by repeatedly agitating with water, or an alkaline solution of mercuric monoxychloride; by phenyl-hydrazin; by treatment with bromine; or by decomposing it with potassium hydrate. The liberation of iodine from iodides, especially in presence of acetic acid, is due to the presence of hydrogen peroxide in the ether, while the brown coloration on addition of potassium hydrate is caused by the vinyl alcohol; an acid reaction of the ether is traceable to acetic acid which is the main product of oxidation of vinyl alcohol. As the formation of vinyl alcohol and hydrogen peroxide is especially promoted by exposure to light, and experiment has shown that perfectly pure and anhydrous ether also undergoes similar changes, the requirement to preserve ether in a dark place is apparent. For pharmaceutical and medicinal uses an ether of neutral reaction, which does not liberate iodine from iodides and which does not become discolored by agitation with potassium hydrate solution, should be pro-

vided. Chemically pure ether may best be prepared by the addition of 7 to 9 gm. phenyl-hydrazin to 5 kilos. ether and subsequently rectifying; good results may also be obtained by treating the ether with a strong potassium hydrate solution and rectifying; this latter method is at present practically employed.—Th. Poleck and K. Thümmel, *Arch. der Pharm.*, 1889, 961.

Dispensing of Thymol Powders.—If thymol be powdered in a porcelain mortar the thymol becomes so highly electrified as to adhere provokingly to all substances with which it comes in contact; it somewhat deports itself like a very deliquescent substance. F. Sengewitz overcomes the difficulty by powdering in an iron mortar, using small quantities at a time and exerting little pressure.—*Pharm. Ztg.*, 1889, 706.

Ethyl bromide has lately been so successfully used in dental operations that preference is given to it over chloroform, nitrogen monoxide and cocaine salts; its success is ascribed to the purity of the chemical as at present made from alcohol, potassium bromide and sulphuric acid. It resembles chloroform in that the pure substance is easily decomposable, and the addition of one per cent. of alcohol or ether retards or prevents the decomposition. The specific gravity of pure ethyl bromide at 15°C. is 1·4735, while that containing one per cent. alcohol is 1·457 at 15° C. Tests of purity are: 1. The absence of color when shaken with an equal volume of concentrated sulphuric acid, and 2. water agitated with ethyl bromide, after separation, should not react acid, nor give a turbidity with silver nitrate solution.—Dr. H. Thoms, *Pharm. Ztg.*, 1889, 705.

Cocaine chromate.—Dr. Karl Mezger uses the formation of this salt as a test for cocaine in as dilute solutions as 1:1,000. The test of identity is applied by dissolving 0·05 gm. cocaine hydrochlorate in 5 cc. water and adding five drops of a five per cent. chromic acid solution; each drop forms a decided precipitate, which, however, again dissolves; after the addition of 1 cc. pure concentrated hydrochloric acid an immediate orange-yellow precipitate of cocaine chromate should appear.—*Pharm. Ztg.*, 1889, 697.

Soaps.—The preparation of soap always requires the use of an excess of alkali which should afterwards be removed by salting out the soap; to obtain a neutral soap this operation must be repeated several times, and the soap so obtained always retains some of the alkaline chloride. Dr. E. Geissler in a paper on this subject recom-

mends that after the saponification of the fat a definite portion of the soap be removed, dissolved in alcohol and titrated with an acid; from this determination the calculation is made as to the quantity of hydrochloric acid needed to neutralize the excess of alkali, and after the addition of this quantity of acid the soap is evaporated to the proper consistence. For the detection of free alkali in soap it is proposed to take powdered soap and cover it with a solution of mercuric chloride, free alkali being indicated by the appearance of a red coloration. Neutral soaps in contact with mercuric chloride did not change in color after three months time, while such soaps as indicated a slight alkaline reaction gradually blackened; of importance is the fact that only such medicinal soaps (containing 2 per cent. $HgCl_2$) as do not give color with mercuric chloride are of antiseptic value. A criterion of good sublimate soap, hence, is its color; a discolored soap being worthless and therefore to be rejected.—*Pharm. Ztg.*, 1889, 671.

Pill Masses.—Creasote pills have been recommended to be prepared by the use of wax or magnesia, but such pills placed in warm water for 24 hours remain intact and do not evince any signs of disintegration, showing the undesirability of these excipients. E. Dietrich gives a formula for a *creasote pill mass*, containing 25 per cent. creasote, which is plastic and will remain so for long periods if the quantity of glycerin given be doubled and the mass kept in well closed vessels. Creasote 10 parts are mixed with glycerin 2 parts and triturated with powdered extract of licorice 10 parts, finally incorporating powdered glycyrrhiza 18 parts. Pills made from this mass are easily disintegrated by the action of warm water; in dispensing the pills finely powdered coffee is advocated as a dusting powder.

For a *Copaiva pill mass* (25 per cent.) the following gives excellent results: Copaiva 10 parts, glycerin 2 parts, mix and incorporate in the order named powdered sugar 10, magnesia 10, powdered glycyrrhiza 8. *Turpentine pill mass* can be made in the same manner.—*Pharm. Centralhalle*, 1889, 676.

Ointment of Iodide of Potassium.—In place of some of the more recent additions to this ointment, made in order to prevent decomposition, E. Dieterich proposes again an older suggestion, namely the addition of medicinal soap. The formula requires 10 parts potassium iodide and one part powdered soap to be dissolved in 9 parts of distilled water and this solution incorporated with 80 parts of a firm paraffin ointment.—*Pharm. Centralhalle*, 1889, 677.

ABSTRACTS FROM THE FRENCH JOURNALS.

Translated for the American Journal of Pharmacy.

Decoloration of Solutions of Iodide of Ammonium.—These are colorless when recently prepared, but soon become yellow owing to a portion of the iodine being set free. Ammonia may be used as a decolorant, but an excess is required; hyposulphite of sodium acts well, but introduces too much tetrathionate of sodium; ether and chloroform, also, are used, but these are not perfectly soluble in water. M. Soucheire recommends that a small quantity of fecula be added to the solution of ammonium iodide, which is then well shaken and filtered. The iodide of starch thus formed remains upon the filter. The filtered solution contains no dissolved fecula; if a drop of tincture of iodine be added to it no deposit or blue coloration is observed.—*Bull. de la Soc. du Phar. du Sud-Ouest*, Aug., 1889.

Properties of "Absolute" Iodoform.—Suillot and Raynaud described their process of making iodoform from acetone, early in the year 1889 (Am. Jour. Phar., 1889, p. 175). The process is based upon the reaction of a hypochlorite upon an alkaline iodide, and the reaction of an alkaline hypoiodite upon acetone, thus giving rise to iodoform. In a communication by M. Casthélaz to the *Congrès de Thérapeutique* it is explained that at the factories near Rouen, iodoform is now made directly from the sodic mother-liquors of sea-weed. The iodide of sodium is taken from the cinders, and, on the following day, the total amount of iodine is precipitated as iodoform. The bromides of potassium and of sodium remain in the liquors, whence they are taken by the usual processes. Iodoform made by this process is called by Casthélaz, "absolute iodoform," because "iodoform by acetone is the result of a complete reaction, without production of free iodine capable of giving rise to iodic compounds; it is obtained directly from the alkaline iodides in a state of great purity, and may, perhaps, be considered absolute." In consequence of its purity, the odor of iodoform thus made is very weak; the substance appears in pale yellow, mica-like scales and is soluble without residuum in alcohol, ether, chloroform and the sulphide of carbon.—*Congrès de Thérapeutique*, 1889.

Solutions of Salicylic Acid.—M. Barnouvin writes as follows to the *Répert. de Phar.*, Nov. 10: The name of solution as applied to the mixture of salicylic acid now in use, composed of salicylic acid, 1 gm.; glycerin, 20 gm., and distilled water, 80 gm., is a misnomer,

for an abundant precipitate is soon formed. I have sought to determine the proper amount of glycerin to be used from the point of view of the needs of practice, and have also endeavored to ascertain the exact quantity of water which it is possible to add to glyceric solutions. I found that 1 gm. of salicylic acid dissolved, with heat, in 50 gm. of glycerin, and gave no deposit on cooling. This degree of solubility is sufficient for many purposes, such as throat-collutories and other washes, which may be made as follows: Salicylic acid, 25 or 50 cgm., glycerin (28°B.) 25 gm.; dissolve with heat. In using a more concentrated glycerin, stronger salicylic solutions may be obtained. With regard to the addition of water, I found that 10 gm. of water added to a 1 to 50 glyceric solution of salicylic acid gave a precipitate. To solutions of 1 to 100, however, water may be added in all proportions.—*Répert. de Phar.*, Nov. 10.

Preparations of Naphthol.—Naphthol is often prescribed in potions which are usually made by dissolving it in twice its weight of ether, alcohol or glycerin and adding the solution to the potion. According to M. Mainiel, naphthol dispensed in this way soon precipitates. He proposes that the naphthol be dissolved in ten times its weight of the oil of sweet almonds. The solution is easily effected with the acid of gentle heat. Gum, syrup, etc. may be agitated with the oil to make an emulsion, in which the naphthol remains suspended in a condition of perfect division.—*Union Phar.; Répert. de Phar.*, Nov. 10.

Sensitive Reagent for Mercurial Vapors.—Professor Merget uses as a reagent a saturated, aqueous solution of nitrate of mercury treated with liq. ammonia until precipitation ceases. The preparation remains unaltered for several months. With this, a few lines may be traced on a sheet of paper and the excess absorbed with a blotter. One-half the sheet is then exposed to the action of the suspected vapors and is afterward compared with the other half, when the mercurial influence of the vapor is detected. The test is very sensitive.—*Bull. de la Soc. de Phar. de Bordeaux*, Sept.

Solidago Virgaurea in Cardiac Dropsy.—Dr. Mascarel is said (*La France médicale*, Oct. 8, 1889) to have used the plant very successfully in these cases. It has long been used by country practitioners to produce diaphoresis. It grows plentifully in the Northern parts of the United States, and resembles *Sol-odora*, the "sweet-scented golden rod," or "blue-mountain tea." In administering it for cardiac dropsy,

Dr. Mascarel reduces the dried plant—stems, leaves and flowers—to a coarse powder, and gives it in doses of one tablespoonful, beaten with an entire egg (yelk and white). He gives but one dose on the first day; but on each of the following days he adds a tablespoonful until seven or eight doses are being taken during the twenty-four hours. The diuresis is said to continue until œdema permanently disappears.

Guaiacum as an Emmenagogue.—The formula of Dr. Ménière's mixture is given in the *Rev. méd.-chir. des mal. des femmes*, as follows: Res. guaiac, 250 gm.; carbonate of sodium, 12 gm.; pimenta, 60 gm.; alcohol of 60 per cent., 100 gm.; macerate for 8 days in a dark cool place, filter, and add spirit of ammonia, 4 gm.; volatile oil of mint, 1 gm. Keep in yellow bottles perfectly sealed. The dose is one teaspoonful in good wine, three times a day, before eating. It is said to have a more reliable action than the other emmenagogues in use.

Derivatives of Acetylphenylhydrazine.—M. Petit (*Soc. de phar. de Paris*, Oct. 2) has prepared several of these by a less complicated process than that usually employed. He causes sodium to act directly upon acetylphenylhydrazine, which he then treats with iodide of methyl, thus obtaining methylacetylphenylhydrazine. By replacing the iodide of methyl with the iodide of ethyl he obtained ethylacetylphenylhydrazine. In the same way he prepared formylphenylhydrazine.

STERCULIA GUM: ITS SIMILARITIES AND DISSIMILARITIES TO TRAGACANTH.[1]

OCCURRENCE OF PARARABIN IN STERCULIA GUMS.

By J. H. Maiden, F. L. S., F. C. S., Curator of the Technological Museum, Sydney.

The existence of a gum on species of *Sterculia* has long been known. It has been recorded from India, Africa and Australia, but with the exception of Flückiger's research in regard to an African species, and some general experiments with the India *S. urens*, nothing appears to be known in regard to them. The object of the present paper is to record some experiments and observations on the gums of Australian and also of an Indian species, in the course of which the author has discovered that they are composed essentially of *pararabin*, and also

[1] Read before the Pharmaceutical Society of Great Britain, at an Evening Meeting in London, Wednesday, November 13; reprinted from *Phar. Jour. and Trans.*, November 16, p. 381.

to show the incorrectness of the idea that they are similar to tragacanth, except in some superficial characteristics.

The author cannot at present see any commercial future before gum of the Australian species; the same conclusion has long since been arrived at in regard to those produced by India ones; in regard to an African species we have the experiments of Flückiger (*infra*).

INDIAN.

(Thirty-one species are described in the "Flora of British India.")

Many Indian species yield gums, but that of *S. urens*, Roxb., is best known. It is obtained from cracks and incisions in the bark, and is mixed with that of *S. villosa* and *Cochlospermum*, and sold under the name of "kalila" or "katira" (Brandis). It is used in India for making sweetmeats (*Cat. Kew Museums*). It exudes spontaneously during the hot season, and occurs in large, light-brown, transparent tough masses. Immersed in water these swell like a jelly, and do not dissolve but by protracted boiling. The solution is not adhesive, and is destitute of the thickness of solutions of ordinary gum. The uses of the gum are very limited; the want of adhesiveness renders it unsuitable for the arts, while its difficult solubility renders it inferior to most other gums for medicinal purposes (O'Shaughnessy, "Dispens."). From time to time samples have been sent to Europe for valuation, but hitherto no use has been found for it, and consequently it has no appreciable value in the markets. The only purpose for which it has hitherto been considered available is as an adulterant of tragacanth, but hardly as a substitute. Some samples either of this, or a very similar gum, have appeared in the London and Liverpool markets, and sold at a low price as false tragacanth and hog gum (Cooke, "Gums and Resins of India," where further particulars are given). Dr. Dymock (*Pharm. Journ.* [3], viii, p. 161) says, "Placed in water it forms a firm, colorless, tasteless jelly, but on the addition of a large quantity [not unless heated, J. H. M.] it dissolves; the solution is precipitated by acetate of lead. It is used as a substitute for tragacanth, and is issued from the Government stores." It would be interesting to know to what use the gum is put after issue, but the same author's "Materia Medica of Western India" throws no light on the subject.

Following are two extracts from a "Descriptive Catalogue of the Gums and Resins in the Technological Museum," which is nearly ready for the press.

Cochlospermum Gossypium, D. C., Kuteera or False Tragacanth. *Sample I.*—Received from Kew. A translucent, horny-looking, shrivelled gum, in irregular pieces as large as walnuts. It is of a dull dirty whitish, yellowish or brownish color, and attached to it are fragments of bark, some of it lace-bark (? sterculiaceous). To say that it is tragacanthoid describes its lustre. It is without taste. It might be used (if that *be* a use) as an adulterant, but not as a substitute for low-grade tragacanth, for it has not the adhesiveness of the latter gum. Mr. Baden-Powell (quoted by Cooke) states that it is used in shoe-making in India. If it has any adhesiveness at all in India it would be worth while to inquire whether it is employed as a substitute for tragacanth in cementing the "wrappers" of Indian cigars. Waring ("Pharm of India") speaks of it as an article of very minor importance. From India (N. W. P.). *Sample II.*—A beautiful selected translucent sample, resembling chalcedony. On tasting it, it was found to be quite acid, and on smelling, the bottle was found to be strongly charged with acetic acid.[1] As far as the samples in the Museum go, it appears to hold good that the paler the specimen, the more acidulous it is. From Calcutta. *S. urens*, Roxb. —Received from the Government of India. I cannot at present detect any difference between this gum and that of *Cochlospermum Gossypium*. I have even transposed the labels, and then have failed to separate the gums, except by guess-work. Some of the pieces taste slightly sour, as mentioned under cochlospermum. Digested in water it swells up and dissolves but slightly. It appears, however, to make a bulkier jelly than cochlospermum, but this difference may be only apparent, owing to the specimens not having been judiciously chosen. Guibourt discusses the subject (Cooke, "Gums and Resins of India," p. 30; *Pharm. Journ.*, xv, p. 58), and arrives at the conclusion that the two trees produce identical gums. Its chemical deportment is the same as that of *S. rupestris*, and the experiments related under the head of that gum (as also the description of its behavior in water) apply here exactly.

Dr. Thomson says the gum of *S. urens* has been used by calico-printers (*sic*), and in his "System of Chemistry," makes this particular gum a sub-division of the gums, as precipitable by a solution of silica (Gmelin).

[1] This was long since pointed out by Guibourt ("Hist. des Drogues," *Pharm. Journ.*, xv, p. 58).

There can be little doubt but that the following gum is attributable to *S. urens*, and the excerpt is interesting as giving a further description, and as placing the objections to its use in another form. The gum had been purchased by a calico-printer in ignorance. "It was in large brown-colored and wrinkled translucent pieces, having a certain degree of softness; so that they could not be pounded in a mortar. When put into water they did not dissolve, but gradually imbibed the water and swelled out into a jelly, so nearly colorless that its presence at the bottom of the vessel containing water was not perceptible till the water was agitated by moving the vessel. When boiled for some hours with water this jelly completely dissolved. But the water was not mucilaginous, like a solution of gum-arabic, nor had it the least adhesive property. . . Thus this substance, though resembling gum in its appearance, possessed none of the properties of that substance, and could not be employed to thicken acids or colors intended to be printed on cloth. . . There is reason to suspect that it came from India" (Thomson, "Chemistry of Organic Bodies, Vegetables," p. 676).

Following are the other oriental species yielding gum, as far as known to the author:—

S. campanulata, Wall. "Exudes a gum resembling tragacanth" (Kurz).

S. ornata, Wall. "Exudes gum" (Kurz).

S. fœtida, Linn. "Exudes gum resembling tragacanth" (Kurz).

S. villosa, Roxb. "Gives a white pellucid gum which exudes copiously from cuts in the bark (Gamble, Brandis). This gum bears the same local name as the produce of *S. urens*.

S. ramosa and *S. piperifolia*, from Pegu, are said by Balfour ("Cyc. of India") to yield gum, but I cannot at present trace these names. It may be that they are synonyms.

AFRICAN.

(Several species are described in the "Flora of Tropical Africa.")

S. Barteri, Mast. (*op. cit.*, 219), is reported to have "resinous" bark, but this is probably an instance of the commonly loose way in which the words "gum" and "resin" are used. A "whitish gum" exudes from the follicles of an undetermined species.

S. Tragacantha, Lindl. Lindley calls this the "gum tragacanth of Sierra Leone." According to Lock (Spon's "Encyc."), it bears the

closest resemblance to the produce of the Indian species of *Sterculia* just described, as is seen, indeed, from Dr. Flückiger's description. Lock states that it is formed in great quantity, and commonly finds its way into parcels of Senegal gum. If Flückiger's conclusions as to its utility are justifiable, it is singular that it has not come into use, but the present writer can find no further allusion to it anywhere.

The following notes on "African Tragacanth" from this species are abstracted from a paper by Dr. Flückiger (*Pharm. Journ.* [2], x, 641).

The substance experimented upon consisted of "irregular, knobby, undulated, droppy, or stalactitic masses, more or less bubbly or cavernous, often exceeding an ounce in weight, of a pale yellowish hue or almost colorless, in small fragments nearly transparent, but seen in mass somewhat opaque by reason of innumerable cracks, which also render it more brittle than true tragacanth. Each mass is, in fact, traversed by curved fissures answering to successive protrusions of gum. Fragments of bark are often adherent to the flat or inner side of the pieces.

"With twenty parts of water coarsely powdered African tragacanth forms, like common tragacanth, a thick, tasteless jelly; with forty parts of water the jelly becomes more fluid. Only a very small quantity of gum is really dissolved in the water; the filtered liquid is not precipitated either by neutral acetate of lead or by absolute alcohol,[1] but on addition of basic acetate of lead it becomes a little turbid. The jelly itself reddens litmus paper. Neither thin slices of the dry tragacanth nor the jelly exhibit any trace of cellular structure, or of starch, even when examined in polarized light by means of a microscope. In this respect the tragacanth of *Sterculia* differs from that of *Astragalus*. As a means of promoting the adhesiveness of pilular masses, I find the former, whether in the form of powder or mucilage, as advantageous as ordinary tragacanth.

"The fine powder on exposure for some days to a temperature of 212° F. loses 20·5 per cent. of its weight. The formula $C_{12}H_{22}O_{11}+5H_2O$ would exactly require 20·5 per cent. of water. . . . Upon incineration, the dried powder leaves 7·8 per cent. of ash, of which the prevailing constituent is carbonate of calcium. . . ."

Dr. Flückiger then reports the result of an ultimate analysis of the

[1] The formation of a ppt. by this reagent is rendered almost impossible in such dilute solution.—J. H. M.

gum, heated in a tube with cupric oxide in the usual manner. He declines to express an opinion as to the proximate constituents of the gum. I have referred to this portion of his experiments below, showing how near he was to the determination of its chief component. He sums up his opinion of its commercial value in the following words: "I infer that the African Sterculia tragacanth may be used both in pharmacy and in the arts, instead of the usual drug of Asia Minor."

AUSTRALIAN.

Bentham, "B. Fl.," 226, makes twelve species, divided into two sections, *Sterculia* and *Brachychiton*, Mueller, "Cens.," 15, erects these sections into distinct genera, adds a new species to each, and rejects *S. fœtida* as Australian.

Baron Mueller says (*teste* Blackett, *Chem. and Drug.*, Austral. ed., 1882, p. 100), "I have noticed gummous exudations from all the Brachychitons in Australia." The present writer has never heard of any from Australian species being described more fully than as being "like tragacanth."

S. diversifolia, G. Don, "B. Fl.," i, 229 (*Brachychiton populneum*, R. Br. in Muell. "Cens.," p. 15). Found in Victoria, New South Wales and Queensland. A "Kurrajong."

In the Clyde River district of New South Wales a correspondent of the writer came across a tree about 1 foot in diameter and 30 feet high. About a bucketful of gum was found at its foot, on the ground, naturally exuded and partly viscid. Enormous tears of the gum had flowed down the stem and were adherent to it.

I have received a quantity of gum of this species from Baron von Mueller. It cannot be distinguished, by any physical characteristic, from the Indian gums *S. urens* and *Cochlospermum Gossypium* already described. It only differs from the gum of *S. rupestris* (*infra*) in being in rounded tears, whereas the latter was much broken and splintered when received.

S. rupestris, Benth., "B. Fl.," i, 230 (*Brachychiton Delabechii*, F. v. M., in Muell. "Cens.," p. 15, *Syn. Delabechea rupestris*). Found in Queensland. A "Kurrajong." Called also "Bottle-tree" or "Gouty-stem."

Delabechia rupestris.—"When boiling water is poured over the shavings of this wood, a clear jelly, resembling tragacanth, is formed, and becomes a thick viscid mass; iodine stains it brown, but not a trace of starch is indicated" (Sir Thomas Mitchell's "Journal of an

Exped. into the Interior of Trop. Australia," etc., p. 155. These remarks are signed by J. L.—Dr. Lindley.

A specimen of the naturally exuded gum in the Technological Museum is remarkably like paraffin in appearance, and almost as free from color. It is rather tough and horny, and breaks with a dull fracture. In the mouth I fail (except in the shape of the pieces) to detect any difference between it and tragacanth. It is in irregular pieces, full of angles and points, the result of the fusion of innumerable tears.

A mass swells up readily in water and then disintegrates. The insoluble portion has a granular appearance similar to that which pearl-sago of exceeding fineness assumes under similar circumstances. The jelly is of snowy or rather icy whiteness, freer from color than the jelly yielded by the best isinglass, and of enormous bulk when the absorption of water is complete.

This gum and tragacanth present many points of difference. Their closest similarity is in outward appearance. *Sterculia* gum does not thicken water, except to a barely appreciable extent, and therefore could not have the economic uses to which the very viscid tragacanth is put. On treating the gums with cold water, a difference between them is the more bluish opalescent appearance of tragacanth, and the granular appearance of the mucilage afforded by *Sterculia*. But these gums may be at once distinguished by the canary-yellow color yielded by adding caustic soda to mucilage of tragacanth and boiling, no coloration being observable in the case of *Sterculia* gum.

The author then repeated the whole of Giraud's experiments on tragacanth, as detailed in *Phar. Journ.* [3], v, 766; viii, 773, and he may at once state that he obtained with tragacanth all the general results recorded by that chemist. He then repeated the experiments, with substitution of *Sterculia* gum for tragacanth, and he presents his results in the form of comparative statements:

Similarities—Qualitative.

1. Horny texture.
2. They swell enormously in water.
3. The jellies redden litmus.
4. They dissolve on prolonged boiling in a large quantity of water.
5. They dissolve on boiling in dilute hydrochloric acid.

Quantitative.

6. They contain about 20 per cent. of water.

Dissimilarities—Qualitative.

	Sterculia.	Tragacanth.
7. In cold water.	*a.* Colorless. *b.* Granular jelly. *c.* Adhesiveness absent or very small.	*a.* Opalescent. *b.* Smooth viscid mass. *c.* Adhesive.
8. Boiling in dilute alkali.	Insoluble.	Almost entirely dissolves.
9. Caustic soda and warming.	No change of color.	Canary-yellow color which fades on cooling.
10. Boiling in dilute acid.	Soluble, forming arabin. [J. H. M.]	Soluble, forming pectin [Giraud].
11. Alcohol added to liquid formed in (10).	Whitish precipitate. (See fuller statement.)	Formation of floating glairy mass.

Quantitative.

	Sterculia.	Tragacanth.
12. Specific gravity.	*S. urens*, 1·49. *S. diversifolia*, 1·472.	1·384 [Watts' "Dict. and Encyc. Britt.").
13. Soluble gum.	Arabin (chiefly). *S. urens*, 3·14 p. c. *S. diversifolia*, 9·88 p. c. *S. rupestris*, 6·9 p. c.	"A mixture of different bodies, and not a definite principle, like arabin. 8-10° per cent. [Giraud]. 7·7 p. c. [J. H. M.].
14. Insoluble gum.	Pararabin. *S. rupestris*, 63·42 p. c. *S. diversifolia*, 61·74 p. c. *S. urens*, 75·1 p. c.	"Pectic compound." 60 p. c. [Giraud].
15. Starch.	None.	2-3 p. c. [Giraud].
16. Ash.	*S. rupestris*, 9·0 p. c. *S. diversifolia*, 8·195 p. c. *S. urens*, [1] 5·83 p. c. *S. tragacantha*, 7·8 p. c. [Fluckiger].	3 p. c. [Giraud]. 3-24 p. c. (mean of some experiments by J. H. M.)
	[1] The author finds 5·46 p. c. of ash in *Cochlospermum Gossypium.*	The author believes in the general accuracy of Giraud's figures, but the difficulties of making an accurate determination are enormous. This explains the fact that no two observers obtain the same figures.

Most Indian specimens of *S. urens* smell a little of acetic acid; tragacanth never does, as far as the author's experience goes.

The author is responsible for all the results in which names are not given in brackets.

EXPLANATORY NOTES ON SOME OF THE RESULTS RECORDED IN THE FOREGOING TABLES.

No. 14. "Some tragacanth was digested with fifty times its weight of water containing 1 per cent. of hydrochloric acid in a water-bath until dissolved; it was then filtered and excess of baryta water added. The precipitate, which formed slowly, was pectate of baryta. When of a suitable consistence, this was washed, suspended in water and treated with excess of hydrochloric or acetic acid, which left a precipitate of pure pectic acid. As the result of numerous determinations, it was found that by this method about 60 per cent. of pectic acid can be obtained from gum tragacanth" (*Pharm. Journ.* [3], v, 766; vii, 773). On repeating these experiments with tragacanth the results were as indicated by Giraud. After some little time there was formed, on addition of baryta water in excess, a whitish or opalescent precipitate of pectate of baryta, very similar in appearance to weak mucilage of tragacanth. The precipitation was complete in forty-eight hours. Sterculia gum substituted for tragacanth gave negative results.

No. 11. Addition of alcohol to dilute acidulous solution.

Sterculia.—The liquid becomes cloudy throughout its whole bulk, behaving in much the same way that a weak solution of arabin would if similarly treated. It is, in fact, found to be arabin.

Tragacanth.—A glairy substance is formed, the transparency of the liquid being scarcely impaired. On standing this jelly-like body rises to the top of the liquid. This is pectin, according to Giraud.

TABLE SHOWING THE AVERAGE COMPOSITION OF STERCULIA GUM.

	Rupestris.	Diversifolia.	Urens.
Soluble in cold water (chiefly arabin)..	6·9	9·88	3·14
Parabin.....	63·42	61·74	75·1
Moisture.....	20·52	20·2	16·6
Ash.....	9·015	8·195	5·83
	99·855	100·015	100·67

The author's discovery of pararabin in *Sterculia* gum really confirms Flückiger's figures obtained by combustion of the gum of *S. Tragacantha* (*Pharm. Journ.* [2], x, 642). His percentage results are practically identical with the generally accepted figures for arabin,

ergo, for pararabin, and his experiments are additional evidence to show the general similarity of *Sterculia* gums. The adhesiveness of that of *S. Tragacantha* is very remarkable, and further information on the subject is desirable. It would be particularly interesting to know the percentage of arabin.

Pararabin, like metarabin, is of course a modification of arabin. While metarabin is converted into arabin by treatment with dilute *alkali*, pararabin is similarly converted by treatment with dilute *acid*. They both are insoluble, but swell up in cold water. A solution of pararabin in weak acid is precipitated by alkalis.

Pararabin is usually obtained from beet or carrot pulp. It constitutes the Chinese vegetable jelly (agai-agai), or Ceylon moss (*Gracilaria*), according to Reichardt (Watts' "Dict.," 3d Supp., Pt. 1, p. 119; Roscoe and Schorlemmer, iii, 2, 571). The present writer took a sample of agar-agar, together with a *Gracilaria* found in Australian waters, and a sample of the Japanese "kanten," said to be obtained from a sea-weed (*Gelidium corneum*). He found them all to consist *mainly* of pararabin, but, unlike *Sterculia* gums, and like tragacanth, he found that caustic alkali produced a canary-yellow color when boiled with them. He also observed (and in this respect these substances differ from both *Sterculia* gum and tragacanth) that when baric hydrate is added in the cold to a solution in weak hydrochloric acid, a canary-yellow color was produced on standing for a few hours. He has not pursued the subject further in this paper, as being, to some extent, a digression.

RATE OF DECOMPOSITION OF CHLORINE-WATER BY LIGHT.[1]

By Dr. G. Gore, F. R. S.

In this research, the author has investigated, by means of the voltaic balance, the kind and amount of chemical change, the rate at which decomposition proceeds, and the chemical composition of the products formed at all stages of decomposition of chlorine-water when exposed to daylight and sunlight in colorless glass vessels.

The chlorine-water, by exposure to diffused daylight, was decomposed with moderate uniformity, but at a gradually diminishing rate,

[1] Abstract from a paper read before the Royal Society; reprinted from *Chemical News*, Dec. 6, 1889, p. 271.

as shown by the losses of voltaic energy, until no further loss of such energy occurred; the liquid then consisted of an aqueous solution of hydrochloric acid, hydrochlorous acid, and chloric acid. By further exposure of the liquid to daylight and sunlight during several weeks, peroxide of hydrogen was formed, and the amount of hydrochloric acid and voltaic energy very slowly increased until that of the latter became equal to that of dilute hydrochloric acid of equivalent strength to the whole of the chlorine present; all the other chief properties of the final liquid agreed with those of a mixture of dilute hydrochloric acid and peroxide of hydrogen. Still further exposure to strong sunlight caused no further change in chemical composition, amount of voltaic energy, or other property of the liquid.

This research shows distinctly that the decomposition of chlorine-water by light may be divided into two essentially different parts, or periods, of chemical change, and that the kinds of chemical change occurring during these two periods are largely different. During the first period, a very great and gradual *loss* of voltaic energy occurs, attended by formation of hydrochloric, hydrochlorous, and chloric acids. During the second period, a moderate and very slow *increase* of voltaic energy takes place, accompanied by decomposition of the hydrochlorous and chloric acids; a further formation of hydrochloric acid, and the production of peroxide of hydrogen. Under the influence of prolonged sunlight, the whole of the oxygen of the hydrochlorous and chloric acids united with water to form peroxide of hydrogen, and the peroxide then combined with the whole of the hydrochloric acid to form a definite "solution compound," represented by the formula $2HCl.H_2O_2$.

The chemical composition of the products of the change at the end of the first and second periods were ascertained by means of the voltaic balance and ordinary chemical analysis. During the first period, forty consecutive measurements of the voltaic energy, at stated intervals of time, were made, and the energy diminished from about 1,219 millions to 2·9 millions; and during the second period eight such measurements were made, and the energy increased to 9·3 millions. A curve is given showing the rate of loss of energy during the first period.

It is interesting to observe that suitably decomposed chlorine-water, or possibly, in its stead, a mixture of—

$$6HCl+HClO+HClO_3$$

in a proper proportion of water, has the property of absorbing energy by exposure to light, very much like that possessed by the green leaves of plants.

ON THE ANTISEPTIC VALUE OF CHEMICAL PREPARATIONS, WITH SPECIAL REFERENCE TO SOME OF THE SALTS OF MERCURY.[1]

By Dr. Behring.

Last year there was a good deal of writing and disputing about the value of antiseptics, especially of iodoform, carbolic acid, preparations of mercury, and creolin. With regard to iodoform, the dispute was keenest. Surgeons had used it profusely, with the best results, and maintained vigorously that, practically, it was a valuable antiseptic, whilst, on the other hand, some experimenters, bringing it into close contact with the germs, made out that it had actually no powers as a germicide. Both sides, as was natural to suppose, were partly in the right; those were, however, most in the right who had practically proved its value. Iodoform, it seems, acts as a disinfectant only when it is being decomposed. In discharging wounds, *especially when the discharge is foul,* the iodoform gets slowly broken up into iodine and hydrogen, and these change stinking pus into scentless, diminish the amount of secretion, and limit the growth of the bacteria that cause it. It is, however, a mistake to think that any fluid coming from a wound will have this effect; the reducing powers of the living germs are necessary; that which causes a wound to foul is what breaks up the iodoform. The iodoform thus resembles a good waiter, it acts only when its services are required.

Germs with but slight decomposing power, such as charbon germs, suffer but little from iodoform, because they cannot decompose it sufficiently quickly to destroy themselves in the process by releasing the iodine. On the other hand, the comma bacilli of Asiatic cholera decompose iodoform quickly, and the result is that these germs are not only hindered in their growth, but killed, and that quickly. All the *anaerobia* Dr. Behring has investigated. *e. g.*, the bacilli of tetanus and of malignant œdema, are strong decomposers, and hence controlled by iodoform. Two years ago he showed that the addition

[1] *Deutsche medicinische Wochenschrift*, Oct. 10, 1889; transtrated and abstracted by W. A. Stewart; reprinted from the *Medical Chronicle*, December.

of iodoform checked the growth of tubercle bacilli in blood serum, but as the growth of these bacilli is but slow, he cannot, as yet, decide whether in this case also the result is due to the reducing power of the germs.

As a rule, the more a bacteria culture stinks, the more certainty is there that the germs are rapid decomposers, and that iodoform will check their growth. Thus, it is not on the staphylococcus of laudable pus that iodoform acts to any great extent, but on the germs that in stinking pus we find alongside the staphylococci.

It has been held that iodoform acts on the ptomaïnes, but to this theory Behring is opposed. Iodoform acts before the ptomaïnes are produced, and besides, these very ptomaïnes of themselves *hinder* the development of pus.

Carbolic acid, once the sovereign antiseptic, naturally led us to think that iodoform would behave in a similar fashion, and hence the mistakes. As a disinfectant, carbolic acids have the advantage of acting almost equally well in checking in almost all circumstances the growth of germs. In the presence or absence of albumen, in acids or alkalies, against aërobic or anaërobic bacteria, carbolic acid acts almost equally powerfully. This is due likely to its molecule, difficult to break up, and very prone to piece itself together again. In oils and in alcoholic and resinous substances it is inert, but, as in wound discharges, etc., it quits these and slips into the water of the discharge, it is practically active, although in these media.

Perchloride of mercury, used by Bergman (1878) for impregnating dressings, and described and praised by R. Koch (1881) as the strongest and best antiseptic, did not in practice come up to the exact figures given by Koch, and the reproach thrown out was that "the human body was no test tube." Koch's experiments regarded the antiseptic value of the perchloride as tested by its action on the germs in broths and gelatin. It was next discovered that the perchloride varied in its action in albuminous and non-albuminous media, in concentrated and weak solutions and at different temperatures. It might have been discovered also, adds Behring, that albuminous media, in which bacteria are already developed, have the property of reducing the perchloride of mercury to calomel, and even to metallic quicksilver. Of course the antiseptic action is gone. Here we have an antiseptic differing entirely from iodoform in its method of action. After these general remarks, our author gives in long detail the results of his numerous elaborate

experiments on the mercury salts and other antiseptics. It is impossible to give these in small compass. The accompanying tables give his chief results:

TABLE I.

PREPARATIONS OF MERCURY.

0 1 per cent. Solutions in distilled water.	I. Stoppage of developm'nt reckoned by $HgKl_2$.	II. Stoppage of developmn't reckoned by Hg.
1. Merc. Chl. $Hg\,Cl_2$	1 : 10,000	1 : 13,300
2. 1 Merc. Chl. + 10 Sod. Chlor. $HgCl_2$ + 10NaCl	1 : 15,000	1 : 20,000
3. 1 Merc. Chl.+3 Sal Ammon. $HgCl_2$ +3 NH_4Cl	1 : 12,000	1 : 16,000
4. 1 Merc. Chl.+½ Pot. Cyan. $HgCl_2$+½KCy	1 : 12,000	1 : 16,000
5. 1 Merc. Chl.+1 Pot. Cyan. $HgCl_2$+KCy	1 : 15,000	1 : 20,000
6. 1 Merc. Chl.+2 Pot. Cyan. $HgCl_2$+2 KCy	1 : 18,000	1 : 24,000
7. 1 Merc. Chl. + 5 Tartaric Acid (Laplace's solution) $HgCl_2+C_4H_6O_6$	1 : 8,000	1 : 11,000
8. Merc. Cyanid $HgCy_2$	1 : 18,000	1 : 24,000
9. Merc. Cyanid and Pot. (E. Merck's crystallized solution) $HgCy_2$ $(KCy)_2$	1 : 24,000 (1 : 20,000)	1 : 32,000
10. Merc. Oxycyanide (prepared by Kahlbaum) HgO $HgCy_1$	1 : 16,000	1 : 20,000
11. Merc. and Pot. Iod. (Nessler's Reagent) HgI_2 2KI	1 : 20,000	1 : 25,000
12. Merc. Formamide (Lieberich's solution) HgO dissolved in a watery solution of Formamide	1 : 10,000	1 : 13,000
13. 1 Merc. Sozoiodol (prepared by Trommsdorff) +2 Sod. Chl.	(1 : 6,000	1 : 18,000
14. 1 Merc. Sozoiodol+3 Pot. Iod	(1 : 10,000)	1 : 30,000

TABLE II.

Stoppage development.

Over 1 : 40,000.....Cyanine; malachite green.

Over 1 : 30,000.....Silver iodide, chloride and cyanide, dissolved in potassium cyanide; silver nitrate.

Over 1 : 25,000.....Saffranin.

Over 1 : 20,000.....Mercuric cyanide.

Over 1 : 10,000.....Mercury preparation of Table I; gold preparations (?); fluoride of antimony and sodium.

Over 1 : 1,500.....Iodine trichloride; saturated solution of soda; platinic cyanide of potassium; hydroxylaminic acid; cadaverine.

Over 1 : 500.....Quinine; turpentine; zinc iodide; piperidine; acid quinine sulphate; carbolic acid; iodo iodide of potassium.

Over 1 : 250.....Oxalic acid; kreasote and thymol from alcoholic solutions.

Over 1 : 150.....Urethane; paraldehyde; chloral hydrate; sodium salicylate; eucalyptus oil; potassium carbonate; potassium bicarbonate; kreolin (Pearson).

Under 1 : 100.....Sodium iodide; kreolin (Artmann); ether.

1 : 15.....Alcohol.

NOTE ON NARCEINE.

By P. C. Plugge, Ph. D., M. D., of Groningen, Netherlands.

Dott's paper on "Narceine and Its Salts,"[1] has directed my attention to an earlier paper of Merck's on "Chemically Pure Narceine."[2] Merck, after describing some experiments concludes: "This behavior stands in contradiction to the assumption hitherto current that narceine is a very weak base," and farther on: "chemically pure narceine, contrary to previous statements, possesses a faintly alkaline reaction." Being convinced of the correctness of both rejected assumptions, I feel obliged to defend my opinion, which is more in harmony with Dott's.

To Dott's remark "that Merck, like many other German chemists, ignores the work done by English and French chemists," I can add, that Merck seems to be equally ignorant of the work done by a Dutch chemist, even after the publication of the results of his work in a wide-spread German journal. However, my paper on opium alkaloids seems also to be unknown to Mr. Dott. Otherwise this author would probably have strengthened his refutation of Merck's conclusions in respect to the strength of the base narceine with some of the results of my investigations on opium alkaloids.

I entirely agree with Dott that the tendency to form basic salts is no proof of strength; and in my opinion the somewhat strange experiment of Merck with narceine, moistened with acetic acid, etc., is of no value in settling this question.

Beferring for further particulars to my circumstantial exposition in the *Archiv der Pharmacie*,[3] I will here shortly repeat the data on the strength of which I have divided the opium alkaloids into strong and weak bases, and have classed the narceine with the last-named group.

I. Differing from all other alkaloids, also from morphine, codeine and thebaine, the three weak opium bases, narcotine, papaverine, and narceine, have no blue-coloring action upon a solution of red litmus, nor any power of neutralizing acids. Therefore, the acid in the solutions of salts of those alkaloids can be estimated with alkali-lye and litmus tincture, as well as in solutions of free acids.

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[1] *Pharm. Journ.* [3], xx, 335 (Oct. 26, 1889).

[2] *Ibid* [3], xix, 1035 (June 22, 1889).

[3] *Archiv d. Pharmacie*, xxiv (1886), 993; xxv (1887), 45, 49, 421, 793 and 805.

This is demonstrated by the following experiments :—

A. Experiments with $\frac{1}{100}$ Normal Solutions.

1. Forty cc. diluted hydrochloric acid are neutralized by 41·7 cc. NaOH solution.

2. Forty cc. diluted hydrochloric acid, after saturation with *narcotine,* are neutralized by 41·5 cc. NaOH solution.

3. Forty cc. diluted hydrochloric acid, after saturation with *papaverine,* are neutralized by 42·2 cc. NaOH solution.

4. Forty cc. diluted hydrochloric acid, after saturation with *narceine,* are neutralized by 42·0 cc. NaOH solution.

B. Experiments with $\frac{1}{10}$ Normal Solution.

5. Ten cc. diluted sulphuric acid are neutralized by 9·65 cc. NaOH solution.

6. Ten cc. diluted sulphuric acid, after dissolving 268 mgrm. *narcotine,* are neutralized by 9·65 cc. NaOH solution.

7. Ten cc. diluted sulphuric acid, after dissolving 300 mgrm. *papaverine,* are neutralized by 9·7 cc. NaOH solution.

8. Ten cc. diluted sulphuric acid, after dissolving 300 mgrm. *narceine,* are neutralized by 9·7 cc. NaOH solution.

C. Experiments with other Alkaloids and $\frac{1}{10}$ Normal Solutions.

9. Ten cc. diluted sulphuric acid are neutralized by 9·65 c.c. NaOH solution.

10. Ten cc. diluted sulphuric acid, after dissolving 250 mgrm. *morphine,* are neutralized by 1·7 cc. NaOH solution.

11. Ten cc. diluted sulphuric acid, after dissolving 299 mgrm. *codeine,* are neutralized by 0·6 cc. NaOH solution.

12. Ten cc. diluted sulphuric acid, after dissolving 308 mgrm. *cinchonine,* are neutralized by 4·6 cc. NaOH solution.

13. Ten cc. diluted sulphuric acid, after dissolving 300 mgrm. *chinine,* are neutralized by 6·0 cc. NaOH solution.

14. Ten cc. diluted sulphuric acid, after dissolving 200 mgrm. *strychnine,* are neutralized by 3·9 cc. NaOH solution.

While the weak bases possess no neutralizing power at all, the alkaloids named *sub.* C. neutralize a corresponding part of the strong acid, as well as the NaOH solution.

Morphine.—$C_{17}H_{23}NO_3 + H_2O = 303$, consequently 250 mgrm. morphine = 7·69 cc. NaOH solution. Therefore in experiment 10 C. I must have a quantity of uncombined acid corresponding with 1·69 cc. NaOH solution ; really 1·7 cc. more used.

In a second series of experiments a fixed quantity of the alkaloid salt, with a definite quantity of acid, was dissolved in water; this solution being colored by litmus tincture, NaOH solution was added until a distinct blue color had appeared. From the quantity of NaOH solution (9·65 cc. = 0·0365 gram HCl) the amount of acid was calculated. While the weak opium-bases have no neutralizing power on acids, and no influence on the color of litmus, the quantity of acid found by titration with NaOH must be the same as that calculated from the formula.

1. *Hydrochlorate of narcotine* containing 7·718 per. cent HCl.

Taken 400 mgrm. with 30·87 mgrm. HCl, dissolved in about 30 cc. water. This solution needed for neutralization 8·4 cc. soda solution = 30·66 mgrm. HCl.

2. *Hydrochlorate of narceine* containing 6·9076 per cent. HCl.

Taken 368 mgrm. with 25·32 mgrm. HCl, dissolved in 50 cc. water ; used 6·8 cc. soda solution = 25·72 mgrm. HCl.

3. *Hydrochlorate of papaverine* containing 9·809 per cent. HCl.

Taken 400 mgrm. with 39·24 mgrm. HCl. Used 10·4 cc. soda solution = 39·34 mgrm. HCl.

All other alkaloids show very different results. Out of several experiments I will quote here only one :

4. *Nitrate of strychnine* containing 15·87 per cent. HNO_3.

Taken 326 mgrm. with 51·73 mgrm. HNO_3, dissolved in 40 cc. water. While this quantity of uncombined nitric acid would require nearly 8 cc. of the soda solution, in the proof the first drop of the natron-lye already caused a deep blue color.

II. Another ground for my division of opium bases into *strong* and *weak* ones is the phenomena shown by its salts with respect to the alkali salts of organic acids.

The strong bases (morphine, codeine and thebaine) are not precipitated by the solutions of the alkali salts of organic acids (acetates, oxalates, tartrates, benzoates, etc.), but from the solutions of narcotine, papaverine and narceine salts the pure alkaloid is precipitated, while these weak bases (R) do not combine with the weak acid :

$$RHCl + CH_3COONa = NaCl + CH_2COOH + R.$$

III. The weak bases, narcotine, papaverine and narceine, are also precipitated from the solutions of their salts by the solutions of pure $NaHCO_2$, while the strong bases, morphine and codeine, remain in the solutions.

IV. Treated in solution with alkali chromates, ferro- and ferricyanides of potash, narceine appears to belong to the weak opium alkaloids.

The fact that narcotine, papaverine and narceine can be separated from the acid as well as from the alkaline solution, by shaking these solutions with benzol, chloroform. etc., after the method of Dragendorff, while the three other opium alkaloids, morphine, codeine and thebaine, can be isolated only by shaking the alkaline solution, places narceine in the group of weak bases.

Concerning the adulteration of commercial narceine maintained by Laborde, I, in accordance with Mr. Dott, think it highly improbable that narceine would be sent out so contaminated, even with the opium alkaloids, morphine and codeine, most widely differing from narceine.

Moreover, several experiments on animals with the different opium bases make it very difficult for me to understand how the activity of the alkaloid could be weakened by the presence of morphine and codeine.

To conclude, I am of opinion that both Merck's impugning the generally acknowledged weakness of narceine and Laborde's assertion concerning the impurity and consequent inconstant therapeutical action of this alkaloid are not founded in truth.

The commercial hydrochlorate of narceine I used for my experiments was procured from E. Merck in Darmstadt in 1886. A careful investigation showed me that this salt was pure. After combustion the platinum double salt gave 14·548 per cent. Pt, while the formula $(C_{23}H_{29}NO_9,HCl)_2PtCl_4$ contains 14·563 per cent. Pt, and Hesse found 14·52 per cent. Pt. An adulteration with morphine or codeine, whose platinum double salts contain 19·966 resp. 19·048 per cent. Pt, would, therefore, have been highly perceptible by largely influencing the residual quantity of platinum.—*Phar. Jour. and Trans.*, Nov. 23, 1889, p. 401.

EFFECTS OF CODEINE.[1]

By Dr. G. Rheiner.

Dr. Rheiner briefly records the therapeutic effects of codeine in thirty-five patients, varying in age from a few weeks to seventy-five

[1] *Therapeutische Monatshefte*, September and October, 1889; abstracted by D. J. Leech; reprinted from *The Medical Chronicle*, December.

years. The majority of these suffered from bronchitis or broncho-pneumonia, six were under treatment for whooping-cough; the remainder were affected with cardiac dyspnœa, asthma, or phthisis. His experience leads him to advocate the use of codeine where a milder narcotic than morphia is wished; and although he thinks that morphia in suitable doses may be given with safety to the youngest children, he looks upon codeine as less dangerous. From relatively large doses, as for example $\frac{1}{70}$ of a grain daily to a child nine months old, he finds no unpleasant effects, and 2 grains daily were quite harmless in adults. He holds that codeine has the advantage over morphia in not causing anorexia. It seems in some cases to increase appetite, probably by its beneficial influence in removing discomfort. Whilst relieving irritation it does not cause sickness or catarrh, and slight dizziness and moderate headache in one or two cases were the only troubles noticed after its use. It may produce its effects in half an hour or not for several hours.

He finds codeine most useful in the bronchitis of children, and adults with no fever or with but slight rise of temperature. Where there is much fever, rapid breathing, etc., it gives little relief. In a case of "pseudo-croup" he found it without benefit, but morphia also failed to soothe. In phthisis codeine had a very beneficial effect, sound sleep following its use; the appetite increased, while the cough became somewhat looser. When Dover's powder replaced the codeine the same relief followed, but the appetite was decreased. In an anæmic individual and in a case of chronic bronchitis Dover's powder caused vomiting, codeine did not. Codeine was found quite useless in an early stage of phthisis, but a Dover's powder also was of no service. Here morphia in $\frac{1}{2}$ to $\frac{3}{5}$ of a grain daily quieted the irritating cough without producing unpleasant effects or sleep. In a case of asthma codeine was completely useless, whilst chloral hydrate given on successive nights seemed to prevent the attacks. In phthisis or heart affections the only effect of codeine was to relieve cough, but it was without injurious effect on the circulation. Out of five cases of whooping-cough in which codeine was tried it was completely useless in four.

The doses of codeine given by Rheiner were small; $\frac{1}{140}$ to $\frac{1}{70}$ of a grain in infants under one year, and from the $\frac{1}{40}$ to $\frac{1}{30}$ of a grain up to five years, whilst to adults from $\frac{1}{3}$ to $\frac{1}{2}$ a grain. On the whole, the observations do not help much in the estimation of the relative

influence of morphia and codeia. Fraser (*British Medical Journal*, Jan. 29, 1889) has given some grounds for believing that the replacement of an equivalent of hydrogen in the hydroxyl group of morphia by methyl (by which codeine is produced from morphia) has simply the effect of weakening physiological action, no special attribute being found in the new compound.

He looks on codeine, therefore, as simply a weak morphia, and the observations of Bruce point in the same direction. Unfortunately Dr. Rheiner, whilst well acquainted with the German and French literature connected with codeine, has failed to acquaint himself with the more recent work done in England, and hence his observations do not throw much further light on a question which is of such great importance both to pharmacologists and therapeutists.

CASTOR OIL ADULTERATION.[1]

By Michael Conroy, F. C. S.

It would be difficult to name a business where the art of adulteration is practiced to the extent that it is in the oil trade. Castor oil, however, is one of the oils that is less subject to adulteration than perhaps any other that is imported, but there has recently been received in Liverpool from Calcutta more than one shipment, numbering several hundred cases bearing the usual marks, which has been found on examination to be adulterated with cocoanut oil to the extent of from 20 to 30 per cent.

Castor oil, owing to scarcity of seed, has recently advanced over 50 per cent. in value, and it is no doubt due to this cause that we find this somewhat novel sophistication. The choice of a substance like cocoanut oil seems very absurd, but we should remember that at the temperature of the Indian climate this oil would be quite liquid, and the fact that it would become solid on its arrival in England would probably not present itself to the native mind. It is this characteristic that first drew attention to the matter, for it was found that this particular lot of castor oil began to become semi-solid on standing a few days after landing.

As it is possible that some of this adulterated oil may find its

[1] Read at a meeting of the Liverpool Chemists' Association, November 7, 1889; reprinted from *Phar. Jour. and Trans.*, November 16, p. 385.

way into pharmacy, I have thought it worth while to bring these facts forward, and to give the results of my experience as to the best means of detecting and estimating the adulterant.

The test given in the British Pharmacopœia is that it is "entirely soluble in one volume of absolute alcohol and in two volumes of rectified spirit." Now this test is quite useless for the detection of cocoanut oil or any other possible adulterant, because oils that are insoluble in both absolute alcohol and rectified spirit are soluble in a mixture of either with castor oil, and I have prepared samples of castor oil containing 10 to 20 per cent. of cocoanut oil which are as freely soluble in these solvents as is castor oil itself. On the other hand, I have never yet met with a sample of castor oil, one volume of which would dissolve in two volumes of rectified spirit of the Pharmacopœia strength, viz., specific gravity ·838 at 60° F. With the thermometer at 70° to 80° F., solution does take place, but not at 60° F. With spirit of specific gravity ·830, one volume of castor oil dissolves perfectly in two volumes at 60° F., so that it will be seen that by either increasing the temperature, or by using spirit a few degrees stronger, solution does take place; but even with this alteration the test will only serve, as has already been shown, to detect adulterants outside of certain limits. Castor oil is also soluble in glacial acetic acid, while all other fixed oils, with the exception of croton oil, are insoluble. This test is given in some works, but I find the same objection to it that I have previously mentioned in connection with the Pharmacopœia test, for notwithstanding the fact that other oils *per se* are insoluble, they are rendered soluble when mixed with castor oil within certain limits.

The chief distinguishing features of castor oil are undoubtedly its high density and its insolubility in petroleum ether (benzolene) when compared with other fixed oils. We find it stated in text books that castor oil is insoluble in petroleum ether, of which, however, it has the peculiarity of dissolving its own volume. This statement is not correct, for I shall show you that castor oil is to a certain extent soluble; also, that under a certain temperature castor oil will not dissolve its own volume of petroleum ether.

This latter feature, I find, affords trustworthy proof of the presence or absence of any other fixed oils.

The following experiment was made with samples of East Indian, French and Italian castor oil, each giving practically the same result.

The petroleum ether used had a specific gravity of ·7033 at 60° F.

Twenty cc. each of castor oil and petroleum ether were mixed by brisk agitation in a tall graduated tube and maintained at a temperature of 60° F.

The mixture never became clear, and on standing for about an hour, a layer of petroleum ether collected on the surface measuring 3 cc. This, as we shall shortly see, has a very important bearing, and it should be borne in mind that the same experiment was tried on many samples from various sources, and that never in any instance at a temperature of 60° F. did a clear mixture result, and in all cases, a separation of petroleum ether took place on standing, amounting to practically the same volume. If on the other hand the mixture be made at a temperature of 70° F. the whole of the ether is dissolved, or if the mixture made at 60° F. be shaken and raised to 70° F. perfect solution takes place, but on cooling again to 60° F. the same amount of separation occurs.

Thus far we have seen the behavior of petroleum ether with genuine castor oil, and we shall now see how it behaves with adulterated samples. For this purpose samples were made each containing 5 per cent. of one fixed oil, such as cotton-seed, cocoanut, etc.

These samples *in all cases* made a perfectly clear solution with an equal volume of petroleum ether at 60° F., and in no instance did any separation take place on standing.

We thus see that so small an amount as 5 per cent. of a fixed oil, other than castor oil, when present is sufficient to cause the whole of the petroleum ether to combine and form a perfectly clear solution, and I think that it has clearly been shown that the test is a reliable and a safe one.

So far I have only made use of this as a qualitative test, but I have hopes that by adopting certain precautions it can be made a quantitative one, for I find that if two volumes of petroleum ether be used instead of one, and thoroughly mixed by agitation at a temperature of 60° F., separation takes place in the adulterated as well as in the pure samples, and that the volume of the ethereal layer increases with the amount of adulterant present with a corresponding diminution in the lower castor oil layer.

To demonstrate this I have here three tall, graduated tubes of 60 cc. capacity.

No. 1 contains 20 cc. of pure castor oil and 40 cc. of petroleum ether.

No. 2.—20 cc. of castor oil containing 10 per cent. of cocoanut oil and 40 cc. of petroleum ether.

No. 3.—20 cc. of castor oil containing 20 per cent of cocoanut oil and 40 cc. of petroleum ether.

These, on being well mixed by agitation and allowed to rest, separate into portions varying with the amount of cocoanut oil present in the samples, as shown in the following table :—

	Bottom or castor oil layer.	Petroleum ether layer.	Total measurement.
No. 1	36 cc.	24 cc.	60 cc.
No. 2	33½ "	26½ "	60 "
No. 3	30½ "	29½ "	60 "

I have already referred to the statement found in text-books to the effect that castor oil is insoluble in petroleum ether, and promised to demonstrate that such was not the case. No. 1 sample proves my contention, for I have already shown that in mixing 20 cc. each of castor oil and petroleum ether, 37 cc. of the castor oil mixture separates, whilst in this last experiment (No. 1 in table) only 36 cc. of the castor oil mixture is left, showing that the extra 20 cc. of petroleum ether has taken up some of the castor oil, and the decrease in Nos. 2 and 3 is undoubtedly due to the fact that the cocoanut oil is dissolved out by the petroleum ether. This can be demonstrated by drawing off the upper layer and driving off the petroleum ether, when the cocoanut oil containing some castor oil will be left.

It must be remembered in reading this table that the lower stratum is a mixture of castor oil and petroleum ether in nearly equal portions, and that the diminution in bulk in Nos. 2 and 3 is due not only to the abstraction of the cocoanut oil by the petroleum ether, but also to the fact that there is that much less castor oil in the sample to combine with the ether, so that the lower portion will show a decrease in volume from these two causes and the upper one a corresponding increase.

I have not tried this experiment with a sample containing more than 20 per cent. of cocoanut oil, because with this percentage of adulteration the separation of the two layers is very slow. This is due to the peculiar solvent action already referred to in connection

with the alcohol test, where a solvent has the power, in combination with a substance which it freely dissolves, to take up a third substance which, without the aid of the second, it could not dissolve. Therefore a sample containing much more than 20 per cent. of cocoanut oil or other adulterant would in conjunction with the petroleum ether carry the castor oil into solution.

As a quantitative test, my experience of this method is only of a few days' standing and I do not wish to speak too dogmatically upon it, but I do think that if carefully carried out at a temperature of 60° F. it is capable of yielding very trustworthy results.

I have alluded to the high density of castor oil as being one of its distinctive characteristics, and in this instance, where the adulterant is cocoanut oil, it is possible to arrive at the percentage of adulterant present by the specific gravity process quite as accurately as by either the saponification equivalent or the iodine absorption test, and with far greater facility.

The specific gravity of castor oil at a temperature of 60° F. is ·964. I have never found any higher, and the lowest that I have met with was a sample of French oil which gave ·9625 at the same temperature. There is a greater range than this given in text books, but I much doubt their accuracy, and in my experience ·963 to ·964 is the correct density for genuine oil. When castor oil is adulterated with 10 per cent. and over of cocoanut oil, the latter separates when the temperature falls to 60° F., and it becomes necessary in such cases to take the density at a higher temperature. I have therefore taken a sample of castor oil possessing a density of ·964 at 60° F. and found its density to be ·949 at 100° F. A sample of cocoanut oil at the same temperature (100° F.) I found to be ·912. Both densities were taken by means of an accurate 1,000 grain bottle. From this it will be seen that the difference between the two densities is sufficient to enable one to arrive at a very accurate estimation, by a very simple calculation, of the amount of cocoanut oil present.

In the first place it is of course necessary to ascertain the presence of cocoanut oil, and this can be done by heating the sample under examination in a small porcelain dish, when the distinctive odor of cocoanut oil can be readily ascertained. By this plan the presence of even 1 per cent. can be detected, and 5 per cent. is quite distinctive to anyone possesring an ordinary sense of smell.

I have heard within the last few days that some castor oil has

reached Glasgow, which, on examination, was found to be adulterated with cotton-seed oil.

The adulterant is probably what is known as "blown" cotton-seed oil, which is made by blowing warm air through the oil. Great heat is thereby developed, and the oil increases in density and viscosity.

The presence of this oil can be detected by my modification of the nitrate of silver test, which is applied as follows:—

1. Make a test solution containing five parts of silver nitrate and one part of nitric acid (specific gravity 1·42) in one hundred parts of rectified spirit (specific gravity ·838).

2. Pour about 100 grains of the oil under examination into a dry test tube, about half-an-inch in diameter, add to it 10 grain measures of the above test solution, and place the tube in *boiling* water for five minutes.

Castor oil assumes a pale yellow color, but the presence of cotton-seed oil causes it to become deep red.

In conclusion, I would just add that the quantitative petroleum ether test is capable of much further development, but being tied for time I have not had an opportunity of fully working it out.

ESSENCE OF SENNA PODS.[1]

By C. Symes, Ph.D.

Nowadays, when, like the Athenians of old, we are constantly looking for something new, it is rather gratifying to recognize the reintroduction of a drug which can claim antiquity as one of its virtues. Not only were senna pods known, but for their properties were recognized, a century or two ago; but as far as I can gather they have not been popular at any period until quite lately.

Dr. Keith, after giving them an extended trial, recommended them to Dr. Macfarlan, who, on gaining experience of their utility as an aperient, contributed a note on the subject which was published in the *Lancet* of July 27 last. Soon after this a parcel which had lain on our shelves undisturbed for nearly twelve months was brought into use on a few ounces of a concentrated infusion being applied for. This

[1] Read at a meeting of the Liverpool Chemists' Association held on November 7, 1889. Reprinted from the *Chemist and Druggist*, November 9, 1889.

small quantity was prepared by the evaporation of an infusion in the way mentioned subsequently by Mr. E. H. Salmon in the *Pharmaceutical Journal* of October 12, p. 281 (Am. Jour. Phar., Nov., p. 581). This produced a dark liquid possessing scarcely any odor or taste, and in no way reminded me of its relation to senna leaves. I should perhaps have agreed with Mr. Salmon that it was tasteless; but recently a customer mentioned that after taking "tasteless castor oil," "tastless cod-liver oil," and "tasteless cascara sagrada," he had come to the conclusion that a chemist's notion of the meaning of "tasteless" was a rather extraordinary one, and differed widely from that of the public generally. This was fairly efficient as an aperient, but as it scarcely came up to expectations a larger quantity was prepared, to meet a growing demand, in what I regard as a more rational manner. Mr. Groves long since determined that the activity of senna leaves depended on the presence of a compound of cathartic acid with calcium and magnesium, and that this was injured by continued heating. The active agent being cathartin in senna pods also, it was evident that to obtain the best results extraction by pressure, as advocated by Mr. E. W. Bell in *The Chemist and Druggist*, October 6, p. 609, must be adopted. Mr. Bell's proposal is in fact all that can be desired, but experience on several batches convinces me that he does not completely exhaust the leaves, and that the resultant fluid extract is not a true valoid.

In other words, the sixteen ounces of finished essence does not, in my experience, fully represent the activity of the pound of pods operated on. No doubt the evaporation method tends to produce the more nearly tasteless preparation, but this will depend to some extent on whether the pods are old and brown or new and green. Nearly all the supply at present is fairly old, for the demand until recently has been exceedingly small; but that it has grown considerably will be evident from the fact that the stock offering on the London market, October 10, was from fifteen to twenty bales, whereas a fortnight later, as far as could be ascertained, this had all been bought up, and there was not a bale remaining in first hands. If the pods have been all well preserved they contain a small quantity of oleo-resin and wax, which is readily extracted by ether (as sample now shown). Dr. James wrote in 1752: "The fruit or follicles of the senna tree are less active than the leaves," and this is supported by some opinions at the present day; but Mr. Salmon found those he examined to contain

two and one-half per cent. of cathartin as compared with two per cent. only in the leaves. But he does not say if this substance was purified further than by precipitation with alcohol; if not, it may contain some little mucilaginous and albuminous matter. Two samples of pods examined by myself contained 0·72 and 0·8 per cent. of pure cathartic acid, obtained by precipitating a fluid extract with an equal bulk of absolute alcohol; the liquid filtered from the precipitated mucilage and salts was mixed with more absolute alcohol, as long as a precipitate was produced. This precipitate was washed with alcohol, dissolved in a little water, freed from albumen by a few drops of hydrochloric acid, and the filtrate completely precipitated by the addition of more hydrochloric acid; the impure cathartic acid thus obtained was purified by dissolving in 60 per cent. alcohol and precipitating by ether. My object has not been to make an exhaustive inquiry into the relative merits of senna leaves and pods, but to propound on a knowledge of the foregoing what appears to me a rational formula for the fluid extract or essence.

Although hydraulic pressure is undoubtedly the best for the purpose, a good screw-press answers fairly well, and the "Enterprise" press is still better. Operating then on 1 lb. of pods, the formula I would suggest is as follows:

Senna pods, slighly bruised	1 lb.
Rectified spirit	5 oz.
Distilled water	12 oz.

Press the pods well down in the containing vessel and pour on the mixed spirit and water; in twenty-four hours reverse the position of the pods and allow to stand a further period of four to five hours, subject to strong pressure; set aside the liquid in a bottle, break up the marc, and pour on this the following previously mixed:—

Glycerin	1 oz.
Liquid ammonia	20 minims.
Distilled water	19 oz.

Allow to stand four hours, press strongly, strain and evaporate the liquid so obtained, until when well mixed with the first liquor and filtered 16 fluidounces will be produced. The addition of one drop each of oil of caraway and essence oil of almonds, with two drops of essence of lemon, makes it really palatable. The medium adult dose is one fluidrachm.

PROTOPLASM AND ITS HISTORY.[1]

By Professor George L. Goodale.

You are invited to examine the more recent additions to our knowledge of protoplasm, restricting the examination to discoveries in the field of botany.

The word protoplasm was coined by Hugo von Mohl in order to designate certain active contents of the vegetable cell. We shall gain in clearness of vision by letting our glance rest first on the results of investigating vegetable cells and cell contents, anterior to von Mohl's time, in order that we may see some of the steps by which this term was reached by him. In 1667, Robert Hooke, of England, published an account of his investigations of minerals, plants and animals under the microscope. His first reference to the structure of plants is in his description of charcoal, and this is followed by a good account of common cork. In these brief and fairly accurate descriptions the author makes use of the word "cell," applying the term to the cavities in charcoal and in cork.

Hooke's interesting treatise was soon followed by two remarkable memoirs—one by an Italian, the other by an Englishman. Malpighi, of Bologna, sent to the Royal Society of London, in 1670, a work entitled Anatome Plantarum. At the period these volumes were in the hands of the Royal Society, Nehemiah Grew, Secretary of the Society, was engaged in work almost identical with that of Malpighi. By Grew the word "cell" appears to have been applied to the cavities in what we may call the softer tissues of the plant. It is certain that neither Malpighi nor Grew recognized, as we can now, the multifarious forms of vessels, fibres, long cells and the like as referable to a common source.

In 1804, the Royal Society of Sciences at Göttingen proposed for competition certain questions relative to the structure and the mode of growth of the tissues. The chief contestants for this prize were Link, Rudolphi and Treviranus. The memoirs of the first two received the prize, that of the latter honorable mention. The names of others should be referred to as having worked at or about this time in the same field, namely: Bernhardi, Mirbel and Moldenhauer, the latter making a great advance in certain directions. But to all of these whom I have mentioned, including the winners of the prize, the important question seems to be, how are the structural elements distributed, rather than how they are related to each other in manner of growth and as respects their origin. With the cell contents they had comparatively little to do. They were busy with the constituents of the frame-work.

Noting the more important discoveries of the next period in their order, we come first upon that of the nucleus of vegetable cells by Robert Brown in 1833 and one mode of cell division by Mohl in 1835. In 1838, the eccentric Schleiden published his Contributions to Phytogenesis, in which he states substantially that cells of plants can be formed only in a fluid containing, as chief ingredients, sugar and mucus (*Schleim*). By this latter term he designated the nitrogenous matters taken collectively and for the first time the vegetable cell was distinctly recognized as a unit of structure always serving as the common basis for the formation of the innumerable shapes of the structural elements.

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[1] From an address delivered by Prof. George L. Goodale, of Harvard University, as Vice-President of the Biological Section of the A. A. A. S., at Toronto, Aug. 28, 1889; abstracted and condensed from the "Botanical Gazette" by G. M. Beringer.

Next comes the master, Mohl. In 1844, in a paper on the circulation within vegetable cells, he speaks of the living mass in each active cell and distinctly recognizes it as that which is the treasury of stored energy and the vehicle of energy under release. He describes it as that which builds shapely forms out of unformed matter and at first hands. This substance he names *protoplasma.*

The term protoplasm was at once adopted by Schleiden, as a good substitute for the indefinite and misleading word *schleim,* which he had employed to designate, essentially the same substance, and it became thoroughly established in scientific terminology. In 1850, Prof. Cohn (and Unger in 1855), showed that the protoplasm of vegetable cells is identical with what had been described, in 1835, in animal structures as *sarcode* by Dujardin.

Mohl gives the following account of protoplasm. "If a tissue composed of young cells be left some time in alcohol, or treated with nitric or muriatic acid, a very thin, finely granular membrane becomes detached from the inside of the walls of the cells, in the form of a closed vesicle, which becomes more or less contracted, and consequently removes all the contents of the cell which are enclosed in this vesicle from the wall of the cell. This inner cell he calls the *primordial utricle.* In the center of the young cell, with rare exceptions, lies the so-called *nucleus cellulæ* of Robert Brown ('*Zellenkern*;' '*Cytoblast*' of Schleiden). The remainder of the cell is more or less densely filled with an opaque, viscid fluid of a white color, having granules intermingled in it, which fluid I call *protoplasm.*"

Hofmeister's description of protoplasm, given in his Vegetable Cell (1867), is: "The substance protoplasm, whose peculiar behavior initiates all new development, is everywhere an essentially homogeneous body. It is a viscid fluid containing much water, having parts easily motile, capable of swelling and possessing in a remarkable degree the properties of a colloid. It is a mixture of different organic matters, among which albuminoids and members of the dextrin group are always present. It has the consistence of a more or less thick mucus and is not miscible with water to any great extent."

From these accounts we see that the following points were regarded as established: (1) All of the activities of the vegetable cell are manifested in its protoplasmic contents. (2) Protoplasm consists chemically of a nitrogenous basis. (3) Protoplasm has no demonstrable structure. (4) The protoplasmic contents in one cell are not connected with the protoplasmic contents in adjoining cells. (5) The nucleus and other vitalized granules in the vegetable cell are formed by differentiation from amorphous protoplasm. It is now our duty to see in what manner these views have been modified during the last twenty or rather ten years.

The first thesis, namely, that all of the activities of the vegetable cell are manifested in its protoplasmic contents, may be regarded as firmly established.

The second thesis, viz., protoplasm consists chemically of a nitrogenous basis, remains unchanged. But, instead of regarding the protoplasmic basis as comparatively simple, it is now known to be exceedingly complex and to contain numerous cognate proteids, some of which can be identified in the basic mass, others in the nucleus, and others still in the vitalized granules. As a result of recent studies, it becomes more and more clear that the chemical relations of the protoplasmic activities are still veiled in mystery. Botanists are now receding from the position that it is safe to use the words albuminoids and

protoplasm interchangeably, the latter term is generally restricted to morphological and physiological conceptions, the former keeps its wide chemical significance. The chemical studies of protoplasm by Rodewald, Reinke, Loew, Bokorny, and microscopically by Schwarz, compel us to recognize in protoplasm a substance of bewildering complexity of composition and constitution. Moreover, you all know how wide this field of research has suddenly become by the discovery that different microbes (which are, essentially, minutest masses of protoplasm) not only give rise to such diverse products, among others the ptomaines, but present such diverse chemical reactions. Protoplasm is no longer regarded by any one in any sense as a comparatively simple substance.

The third thesis, namely, protoplasm has no demonstrable structure, has been modified in a striking manner as a result of improved appliances for research. By better methods of staining, and by the use of homogeneous i n-mersion objectives, the apparently structureless mass is seen to be made up of parts which are easily distinguishable. There has been, and in fact is now, a suspicion that some of these appearances, under the influence of staining agents are post-mortem changes and do not belong to protoplasm in a living state. But it seems to be beyond reasonable doubt that protoplasm is marvellously complex in its morphological and physical as well as its chemical constitution.

Fourth, we are to glance at the accepted statement that the protoplasmic body or protoplast of one cell is cut off by the cell wall from all connection with the contiguous cells. It has been shown by Gardiner and others that there are intercommunicating threads of protoplasm of extreme fineness between adjoining cells, and these living threads maintain connections, sometimes direct, sometimes indirect between one protoplasmic mass and another. This has been shown to be so widely true in the case of plants investigated that the generalization has been ventured on, that *all the protoplasm throughout the plant is continuous.*

The fifth thesis has been completely controverted. Instead of believing, as formerly, that all the granules within the cell arise *de novo* from the protoplasm in which they are imbedded, we are now forced to regard all of them as springing from pre-existent bodies of the same character. Hofmeister, in 1867, stated distinctly that the nucleus arises from homogeneous protoplasm, and that in all cell-division the nucleus must first disappear, two new ones arising in its place. The nucleus occupied a secondary place as a derivative organ, and the chlorophyll granules were believed by him and his contemporaries to be new formations from homogeneous protoplasm under certain conditions of light, temperature and food. Researches show that the nucleus in all cases hitherto examined springs from a pre-existent nucleus by a process of division.

The extraordinary manner in which the nucleus, both in common cell-division and in reproductive blending, carries ancestral characters and controls the distribution of nutritive materials is as yet the greatest mystery in vegetable life.

Formerly it was held that the other granules imbedded in the protoplasmic body known as chlorophyll granules, sprang by a process of differentiation from the shapeless mass in each exposed cell. Researches have shown beyond any reasonable doubt that these chlorophyl granules always arise by a process of division from pre-existent granules. It is known that at the growing points, where leaves are developed, the cells contain granules of about the consistence

and color of protoplasm itself (chromatophores), the products of whose division are three-fold, some of the resulting granules being colorless, others become true chlorophyll granules, while others still, in those leaves which become the leaves of the flower and the fruit, assume colors other than green.

Such, then, are some of the more important changes which have taken place with regard to our knowledge of the living contents of vegetable cells.

VARIETIES.

Syzygium Jambolanum, De Candolle.—Dr. C. Græser has experimented upon dogs rendered diabetic by the administration of phloridzin, and ascertained that the excretion of sugar was promptly reduced from 80 to 86 per cent. by the administration of extract of jambul, concentrated so that 100 gm. of fruit were represented by 16⅓ gm. of the kernel and 11⅔ gm. of the rind extract. The dose was 6 to 18 gm. daily.—*The Lancet*, Nov. 2, 1889.

Antidote for Morphine.—Professor Arpad Bokai (*Inter. Klin. Rundschau*) recommends picrotoxin as an antidote for morphine, on the ground that it exerts an antagonistic action to morphine on the respiratory centres; also that it is a powerful stimulant to the vaso-motor centre, and in this respect likewise an antagonistic to morphine; further, that the action of morphine on the cerebrum is directly opposed to that exerted by picrotoxin, and, finally, Professor Bokai suggests that the previous administration of a small dose of picrotoxin might reduce the danger of asphyxia in chloroform and narcossis.

Action of Hydrastis canadensis.—From his physiological experiments upon rabbits, Heinricus (*Fortschr. d. Med.*, June 15, 1889) concludes that small doses strengthen the respiration for a short time; large doses stop it for a time, and then render the movement superficial. He could not find it exercise any influence on the contractile power of the uterus or vagina.

The astringent and at the same time weak local anæsthetic action of hydrastine has led Felsenberg (*Wiener med. Blätter*) to employ the fluid extract of hydrastis in cases of chronic pharyngitis accompanied with tonsillar hypertrophy. On painting the affected mucous membrane several times daily, a distinct decrease of the redness and swelling became evident. The subjective symptoms quickly abated; the patient became readily habituated to the bitter taste.

Poisoning by Salt of Sorrel.—A man accidently swallowed about half an ounce of salt of sorrel dissolved in water. Within three minutes he experienced a severe burning pain in the gullet and stomach. Shortly after a brownish foam flowed from his mouth and he became partially unconscious. An emetic was administered, after which he vomited and was purged. He slept for two hours and on awaking had severe pain in the back. Three days after he was pale and haggard, tongue coated, intense thirst, temperature 102° F., perspired freely, great pain in lumbar region, tenesmns with blood-stained stools, urine high-colored. The patient recovered, but suffered from pain after taking food, constipation, and great debility for some time.—*R. Park in Glasgow Medical Journal*, September, 1889.

Pereirine and Quinine in Malarial Fever.—Dr. Tibiricá, physician to the Hospital Santa Veridiana in S. Paulo, Brazil, publishes in the *Revista Medica de S. Paulo* a paper on the "Advantages of employing Pereirine as an Adjuvant and

as a partial Substitute for Quinine in Malarial Fevers." Pereirine appears to augment the proper action of quinine without exerting any serious depressing effect on the heart. Instead, therefore, of prescribing quinine alone in 15 gr. doses, he orders 7½ gr. of quinine combined with an equal quantity of pereirine, a combination which appears to exert the same effect over the malarial fever as 15 gr. of quinine, but to be much less depressing to the heart.—*The Lancet*, November 2.

Antiseptic Solution for Sponges is recommended by Prof. Berrens to be made by dissolving thymol 1, in alcohol 4, and adding distilled water 1,000 parts.—*Gaz. Gynoc.*

Oil of Turpentine in Whooping-cough.—Dr. Vascencellos des Post employs turpentine in whooping-cough by dropping it upon the child's pillow, thus causing constant inhalation of the vapor; or it is given in capsules, or in the form of a mixture combined with belladonna, or as an enema.—*L'Union Méd.*, October 12, 1889.

MINUTES OF THE PHARMACEUTICAL MEETING.

PHILADELPHIA, December 17, 1889.

The meeting was organized by calling Mr. Wm. B. Webb to the chair.

The minutes of the last meeting were read and no corrections being called for they were approved.

A paper upon the *purification of benzin* for pharmaceutical and chemical purposes was read by Mr. Geo. M. Beringer, Ph. G.; it was accompanied by specimens of the crude and purified articles; the freedom from all unpleasant odor when permitted to evaporate was noticed by those who examined the samples. Professor Trimble inquired what proportion of benzin was recovered in the distillation. Mr. Beringer said he could not state the percentage recovered, but that the process could be economically done even at a large loss of benzin when compared with the cost of the article sold as petroleum ether.

Mr. Joseph W. England called attention to the article known commercially as *synthetic carbolic acid*, the melting point of which is given at 41° C. or several degrees higher than that of the crystallized carbolic acid of the market. Its odor is also different, being less penetrating and more pleasant.

Mr. England read a paper upon *pharmaceutical incompatibility*, discussing practical questions which are of frequent occurrence.

A sample of *saffron* was exhibited by Professor Trimble which had been presented to him by Mr. J. L. Lemberger, of Lebanon, Pa. It was similar to that described by Mr. Beringer last month. A sample of it was examined microscopically by Mr. Bullock who reports on it as follows:

"Water dissolves the coloring matter and a heavy white powder is deposited; the color given to the water is not that of saffron, but resembles the aniline color saffranine. After removal of most of the color by water the addition of a dilute solution of chlorinated soda bleached the fibres entirely. When dissected by needle points it was resolved into filaments the entire length of the pieces; these when placed upon a microscope slip and moistened with a

solution of chloride of zinc containing iodine gave to the interior structure the blue color of cellulose, the outside sheath staining yellow. After bleaching, nodes with buds are distinctly visible on many of the pieces. The material appears to be a species of grass stained with saffranine, and is doubtless the same adulterant referred to by Geo. M. Beringer in his paper published in the December number of the AMERICAN JOURNAL OF PHARMACY. A lot of this saffron has been distributed among the wholesale trade in Philadelphia at a price nearly approaching that of pure saffron. A sample can submitted to us had pure saffron on top, and beneath the mixture containing about 80 per cent. of impurity."

Professor Trimble read a paper in reply to some criticisms on a paper published in the AMERICAN JOURNAL OF PHARMACY, page 398, for 1889, upon *oils of wintergreen and birch.* The paper was illustrated with a few experiments showing the accuracy of his statements. All the above papers were referred to the Publication Committee.

A letter from Mr. W. H. Shively, Ph. G., of the class of 1842, was read, congratulating the college upon the great advances made in the educational department of the college, and expressing his best wishes for its continued prosperity.

There being no further business, on motion adjourned.

T. S. WIEGAND,
Registrar.

OBITUARY.

Edward B. Garrigues deceased at his residence in this city on the 3d day of November, 1889, in the 95th year of his age.

He was the last of the sixty-eight original members who founded the Philadelphia College of Apothecaries in 1821. The minutes of the College inform that the above number of members comprised about one-half of the druggists and apothecaries at that time engaged in business in Philadelphia.

In 1822 the College was incorporated by the Legislature of Pennsylvania as the Philadelphia College of Pharmacy. In 1826 Mr. Garrigues was elected Treasurer of the College and served as such until September, 1838, when he resigned his membership in the College on account of having retired from the drug business. In accepting his resignation the thanks of the College were presented to him "for his long-continued and faithful discharge of the duties of that office," and he was requested to retain his certificate of membership as an evidence of the appreciation of the College for his services.

In 1879, by direction of the College, his name was again placed on the roll of active members with remission of all annual dues.

Mr. Garrigues was born in Philadelphia on the 8th of October, 1795—his great-grand father was among the Huguenots who left France after the revocation of the edict of Nantes in 1685. The family name was De la Garrigue.

His early education was at "West-town," a school conducted by the Society of Friends. At a suitable age he was apprenticed to John Hart, whose store was on Second street below Market street, to learn the drug business; after serving his time, he opened a store on Sixth street above Market street, subsequently removing to the N. W. corner of Market and Sixth streets, where he conducted a successful business for nearly twenty years. He then built a store and dwelling at the N. W. corner of Sixth and Spring Garden streets, to which place he removed his business; after remaining here a few years he disposed of his business and retired.

Meeting with losses in other mercantile ventures he returned to the drug business in 1843, locating at the N. E. corner of Tenth and Fairmount avenue, and continued in business until January, 1887, when advancing age counselled his retirement--leaving the conduct of the business in the hands of his partner, E. M. Boring.

Educated in the Society of Friends and conforming through a long life to the customs of that Society in language and apparel, he was in this respect the last of its numerous members who have done honor to the business of Druggist and Apothecary in Philadelphia. He was for a time a manager of Friends' Asylum for the Insane at Frankford, a trustee of Haverford College, and a school director in the district of Spring Garden.

A man of even and genial temperament, courteous in address and pleasant in his intercourse, he was esteemed by those who knew him. He leaves two daughters--his son Samuel S. Garrigues, a graduate of this College, deceased in May, 1889. C. B.

CLASSES

—OF THE—

PHILADELPHIA COLLEGE OF PHARMACY,

SIXTY-NITNH ANNUAL SESSION, 1889-1890.

JUNIOR CLASS.

Name.	*Place.*	*State.*	*Preceptor.*
Akers, Frank Leamer,	Hollidaysburg,	Pa.	T. W. Snyder.
Arnold, Henry Peter,	Philadelphia,	Pa.	Lantz Bros.
Baer, Elizabeth Houton,	Philadelphia,	Pa.	
Baker, Thomas Jennings,	Easton,	Pa.	R. W. Cuthbert, Ph.G.
Bast, Charles Lewis,	Baden,	Germ'y	N. A. Cozens, Ph.G.
Baumgartner, Wm. Jacob,	Philadelphia,	Pa.	L.W. Hildenbrand, M.D.
Beavers, Frank Washington,	Scranton,	Pa.	G. W. Jenkins.
Beck, Robert Wilbert,	Sharon,	Pa.	A. L. Beck, Ph.G.
Bender, Edward Augustus,	Elm,	Pa.	L. C. Funk, Ph.G.
Besore, Alexander Stewart,	Shippensburg,	Pa.	J. L. Supplee, Ph.G.
Bietsch, George Edward,	Chambersburg,	Pa.	W. E. Lee, Ph.G.
Binkley, Harry Jonathan,	Wernersville,	Pa.	W. F. Potteiger, Ph.G.
Bitler, Harry,	Reading,	Pa.	Wm. M. Koenig.
Blair, Henry Cowan, 3d,	Philadelphia,	Pa.	H. C. Blair's Sons.
Blow, Robert Gillingham,	Beverly,	N. J.	Dr. A. W. Taylor.
Boggs, Harry Leslie,	Charleston,	W. Va.	E. L. Boggs.
Bonfoey, Hubert Raymond,	Waverly,	N. Y.	C. F. Chaffe
Boyer, Franklin Nagle,	Reading,	Pa.	J. A. Gingrich, Ph.G.
Boyles, Col. James Clarkson,	DuBois,	Pa.	Dr. R. M. Boyles.
Breidinger, Lewis Abraham,	Philadelphia,	Pa.	J. H. Munson, Ph.G.
Bresser, Otto Charles,	Scranton,	Pa.	Carl Lorenz.
Brice, Wm Otto,	Winnsboro,	S. C.	C. Shivers.
Bridgman, Wm. George,	Liverpool,	Eng.	H. Lee Barber.
Bright, Harry H.,	Bernville,	Pa.	Dr. W. E. Donough.
Brown, Albert Ludwig,	Reading,	Pa.	McCurdy & Durham.
Brown, Charles,	Philadelphia,	Pa.	W. J. Pechin.
Brown, Frank Luther,	Lebanon,	Pa.	R. P. Marshall, Ph.G.
Bunker, Wm. Beatty,	Bellefontaine,	Ohio	E V. Pechin.
Burdick, Arch. Webster,	Carbondale,	Pa.	A. W. Reynolds.
Butz, Alfred Sylvester,	Kutztown,	Pa.	E. J. Sellers.
Campbell, Theodore,	Daretown,	N. J.	Geo. H. Whipple.
Carmany, Henry Batdorff,	Myerstown,	Pa.	Dr. W. C. Kline.
Carpenter, Wm. Asbury,	Georgetown,	Del.	D. G. E. Musselman.
Carrow, Richard Norris,	Camden,	Del.	Jas. L. Graham, Ph.G.
Carson, Henry Martin,	Hastings,	Neb.	Dr. C. D. S. Fruh, Ph.G.
Clayton, McClellan,	Mannington,	W. Va.	J. C. Dent.
Clingan, Wm. Arthur,	Sioux City,	Iowa	
Cochran, Ardesco Bright,	Apollo,	Pa.	T. A. Cochran.
Collins, Willard Love,	Montoursville,	Pa.	J. R. Smyser, Ph.G.

Name.	*Place.*	*State.*	*Preceptor.*
Colquhoun, John H.,	Upland,	Pa.	O. P. Hooper, Ph.G.
Comfort, Newton C.,	Mechanicsburg,	Pa.	Henry Mueller, M.D.
Cooper, Herbert,	Dover,	Del.	H. S. Eckels.
Coulomb, C. A.	Philadelphia,	Pa.	
Coxe, Russel LeVan,	Schuylk'l Haven	Pa.	H. N. Coxe.
Crouse, James Norton,	Logania,	Pa.	T. Hetherington, Ph.G.
Cunningham, T. S. McNeilly,	Clarksville,	Tenn.	Askew & Edwards.
Daley, Miles Ferris,	Waterbury,	Conn.	Dr. Geo. O. Robbins.
Danner, John,	Bethlehem,	Pa.	H. K. Mulford, Ph G.
Davis, Harry Morgan,	Haverford,	Pa.	Harry Cox, Ph.G.
Deen, William Lewis,	Lancaster,	Pa.	John F. Long's Sons.
Devine. Oliver Crawford,	Philadelphia,	Pa.	Dr. Devine.
De Vries, Robert Tivis,	Wheeling,	W. Va.	Chas. Menkemeller.
Dickel, William John,	Philadelphia,	Pa.	F. F. Druecing, Ph.G.
Donoghue, Robert Ligonius,	Philadelphia,	Pa.	W. A. Musson.
Douty, John Blundon,	Shamokin,	Pa.	H. Moll & Co.
Dreisbach, Luther Albert,	Easton,	Pa.	Wm. H. Hamman.
Elliott, Walter Roland,	Renovo,	Pa.	W. E. Hall.
Elston, Clarence William,	Downingtown,	Pa.	J. H. Stermer, Ph.G.
Eppstein, Jacob,	Hoppstardten,	Germ'y	C. E. Spenceley, Ph.G.
Eshbach, Wiliam Wallace,	Bethlehem,	Pa.	Dr. Geo. P. Kern.
Fadeley, Robert Wesley,	Philadelphia,	Pa.	Jas. Huston.
Ferguson, Enoch Pennock,	Coatesville,	Pa.	A. G. Miller.
Fernsler, Edward Shoener,	Pottsville,	Pa.	James N. Hodgson.
Fessler, Thomas Addison,	Muncy,	Pa.	W. P. I. Painter & Son.
Fies, John Henry,	Lancaster,	Pa.	A. A. Hubley.
Finney, John Joseph,	Conshohocken,	Pa.	H. J. G. Hallowell.
Fisher, Joshua Fetterman,	Catawissa,	Pa.	Norman G. Ritter, Ph.G.
Fox, Charles,	Philadelphia,	Pa.	
Freeman, George Washington,	Philadelphia,	Pa.	F. C. Davis.
Fredericks, Harry,	Philadelphia,	Pa.	L. C. Funk, Ph.G.
Frey, Frank Joseph,	Union Oity,	Ind.	John P. Frey, Ph.G.
Fry, Harry Edmund,	Forksville,	Pa.	W. T. Randall.
Fry, Nelson Becker,	Harrisburg,	Pa.	Jas T. Shinn, Ph.G.
Furl, Irwin William,	Lock Haven,	Pa.	Franciscus & Co.
Gamp, Joseph,	Philadelphia,	Pa.	French, Richards & Co.
Garcia, Juan Reyes,	Porto Rico,	W. I.	R. C. Martin.
Garges, Alfred Ball,	Zanesville,	Ohio	Graham & Co.
Gerlach, Frank Christian,	Wooster,	Ohio	J. Zimmerman & Co.
Good, Benjamin Mylin,	Lancaster,	Pa.	C. A Heinitsh, Ph.M.
Goos, Charles.	Philadelphia,	Pa.	Wm. A. Fetters, Ph.G.
Gorrell, Jr., Benjamin Harvey,	Lexington,	Va.	B. H. Gorrell.
Graham, Fred. William W.,	Philadelphia,	Pa.	
Gressley, William Robert,	York,	Pa.	B. S. Gilbert & Co.
Grotevent, John Frederick,	Harrisburg,	Pa.	Dr. T. E. Conard, Ph.G.
Gruhler, Christian,	Shenandoah,	Pa.	A. Wasley.
Guest, Owen Lovejoy,	Swedesboro,	N. J.	S. S. Guest, Ph.G.
Haake, Wm. Henry,	Cleveland,	Ohio	A. Mayell & Co.
Hadley, Harry Cornish,	Kennett Square,	Pa.	D. W. Hutchison.
Hague, Wm. Henry,	Barnesville,	Ohio	T. H. Potts, Ph.G.
Haines, Joseph Ridgway,	Mount Holly,	N. J.	Prickitt & Barrington.
Hall, Thomas Murphy,	Middletown,	Del.	Howard Knight, Ph.G.
Hamilton, James Harry,	Mount Holly,	N. J.	E. B. Jones.
Hammerquist. Charles,	Jamestown,	N. Y.	H. C. Lawall, Ph.G.
Hankey, William Tabor,	Trempealeau,	Wis.	T. H. Spence.
Harbach, Charles Cathrall,	Falls Schuylkill,	Pa.	Dr. Eli S. Beary.
Harders, Mae Thompson,	Philadelphia,	Pa.	Dr. S. Hayhurst, Ph.G.
Harrington, Geo. Washington,	Hazleton,	Pa.	Dr. L. H. Smith.
Hartman, Frank Gast,	Lancaster,	Pa.	Sam'l B. McCleery, M.D.

Name.	*Place.*	*State.*	*Preceptor.*
Haydock, Susannah Garrigues,	Philadelphia,	Pa.	Dr. S. Hayhurst, Ph.G.
Hayes, John Carroll,	Mifflinburg,	Pa.	D. H. Ross, Ph.G.
Head, Raymond Cyril,	Latrobe,	Pa.	Jos. Fleming & Son.
Heckler, Franklin Jacob,	Columbia,	Pa.	P. S. Brugh.
Heichhold, Henry Philip,	Philadelphia,	Pa.	C. H. Bohn.
Henry, Wm. Frederick,	Bellaire,	Ohio	M. N. Mercer.
Herber, Conrad J. Aug. Steph'n,	Terre Haute,	Ind.	John T. Gulick.
Herr, Harry Eastburn,	Masonville,	N. J.	D. W. L. Matthews.
Hicks, Henry Thomas,	Raleigh,	N. C.	J. S. Pescud.
Hill, William Maurice,	Lansford,	Pa.	J. H. Kerr, Ph.G.
Hoch, Jacob,	Easton,	Pa.	Milton M. Buss.
Hohman, Theodore Albert,	Wheeling,	W. Va.	Chas. R. Goetze, Ph.G.
Horn, Edgar Austin,	Lehighton,	Pa.	Dr. C. T. Horn.
Hough, John Wallace,	Shippensburg,	Pa.	J. C. Attick & Co.
Hudson, Charles Marcus,	Stockton,	Md.	E. Fountain.
Hutchison, Burtt Taylor,	Bangor,	Pa.	S. E. R. Hassinger, Ph.G.
Hutchinson, William,	Delaware City,	Del.	W. A. Jester.
Ingram, Edgar Wilson,	Lewes,	Del.	A. T. Pollard & Co.
Ingram, John S.	Atlantic City,	N. J.	Dr. U. Ingram.
Irvine, John,	Carlisle,	Pa.	A. Tatem, Ph.G.
Irwin, Robert Sloan,	Newtown,	Pa.	C. G. A. Loder, Ph.G.
Janney, Edward Walker,	Philadelphia,	Pa.	R. Shoemaker & Co.
Jones, William,	Waterville,	N. Y.	E. G. Bissell, Ph.G.
Jones, William Hewitt,	Lansford,	Pa.	Dr. J. Benj. Jones.
Kasten, William Henry.	E. Mauch Chunk	Pa.	Jas. M. Hess.
Kessler, Francis Edward,	Logan,	Ohio	F. W. E. Stedem, Ph.G.
Ketterer, Martin,	Philadelphia,	Pa.	J. C. Phillips.
Keyes, James Elihu,	Oneonta,	N. Y.	E. E. Ford.
Kinsel, Grant Arthur,	Lewistown,	Pa.	A. P. Martin.
Kirk, Samuel Bird,	Curwensville,	Pa.	
Kitchen, Charlie E.	Piqua,	Ohio	Pearl I. Hedges.
Kittson, Edwin Forrest,	Media,	Pa.	W. E. Dickeson.
Koch, Louis Homer,	Leetonia,	Ohio	Harper & Witzeman.
Koenig, Albert,	Philadelphia,	Pa.	D. Milligan.
Krall, George Heyde,	Mechanicsburg,	Pa.	Eberly Bros.
Krapf, Daniel,	Eckhart Mines,	Md.	
Krebs, Harry Jacob,	Mahanoy City,	Pa.	A. C. Weber, Ph.G.
Krebs, Paul,	Cleveland,	Ohio	Herman Krebs.
Kulp, Austin William,	Lock Haven,	Pa.	T. C. Hilton & Co.
Kunkel, Daniel,	New Ringgold,	Pa.	Dr. A. S. Erney.
Lack, Charles Eugene,	Bethlehem,	Pa.	H. F. Backenstoe, Ph.G.
La Dow, Addington,	Newport,	N. Y.	E. M. Smyser, M.D.
Landon, Francis Patterson,	Salem,	N. J.	F. W. Fenn.
Lane, Samuel Hetich,	Mecersburg,	Pa.	Chas. M. Edwards.
Lefferts, Henry Tomlinson,	Southampton,	Pa.	J. N. Antill, Ph.G.
Lehman, Edward,	Memphis,	Tenn.	Dowdy & Co.
Leinbach, Frank Irwin,	Antes Fort,	Pa.	Thos. D. Baker, Ph.G.
Levergood, John Lane,	Wrightsville,	Pa.	Dr. W. L. Mathews.
Lewis, John Frederick, Jr.,	Gordon,	Pa.	J. E. Gregory, Ph.G.
Long, Harvey,	Middletown,	Pa.	John W. Renalt.
Lumb, Charles Thomas,	Frankford,	Pa.	Abram L. Lumb.
Lupin, Emanuel,	Russia,	Europe	H. K. Mulford, Ph.G.
Lupus, Herman Earnest,	Camden,	N. J.	Alexander A. Weber.
Lynch, Edmund Thomas,	Wilmington,	Del.	H. R. Bringhurst.
Lyons, Frank Floyd,	Youngstown,	Pa.	McEwen & Breaden.
MacFaden, Douglas Henry,	Philadelphia,	Pa.	Valentine H. Smith.
McBride, James Edward,	S. Bethlehem,	Pa.	Sheets & Addis.
McClellan, Samuel Lee,	Cochransville,	Pa.	S. K. Hammond.
McClintock, James,	Germantown,	Pa.	Warren A. Poley.

Name.	*Place.*	*State.*	*Preceptor.*
McDonnell, Chas. Pancratius,	Philadelphia,	Pa.	Dr. J. M. Wallis.
McFarland, Robert,	Philadelphia,	Pa.	W. N. Stansbury, Ph.G.
McGregor, Eugene Charles,	Columbia,	S. C.	W. C. McGregor.
McLaughlin, Philip Celestine,	York,	Pa.	Dale, Hart & Co.
MacLennan, Wm. Feinour,	Philadelphia,	Pa.	W. F. Steinmetz.
McMeekan, Chas. Jas. Harvey,	Germantown,	Pa.	C. E. Davis.
McMillan, W. C.,	Marion,	S. C.	W. C. McMillan (Dec'd)
Main, Clinton Eugene,	Frederick,	Md.	S. Schley & Co.
Manning, Charles La Forge,	Trenton,	N J.	Wm. H. Laubach, Ph.G.
Markley, William Arnold,	Reading,	Pa.	John B. Raser.
Martin, Warren Dickerson,	Ambler,	Pa.	Charles Rutherford.
Matthews, Edgar Morton,	Jefferson,	Ga.	H. H. Bell.
Mauter, Fred. Augustus,	Farmington,	Me.	W. H. Braddock.
Mayer, Max B.,	Ashland,	Pa.	S. C. Voshage.
Mayes, Thomas Enoch,	Lewistown,	Pa.	J. A. Matthews' Sons, Ph.G.
Mendenhall, Harry Carleton,	Bloomsburg,	Pa.	J. B. Moore.
Mengel, Levi Walter,	Reading,	Pa.	Chas. M. Steinmetz.
Meroney, John Patrick,	Camden,	S. C.	Geo. B. Evans.
Miller, Franklin James,	S. Bethlehem,	Pa.	Dr. F. S. Buchman.
Milliken, William Houston,	Philadelphia,	Pa.	Edward C. Jones.
Mitchell, Henry,	Philadelphia,	Pa.	C. W. Hallowell.
Moon, Joaquin Richard,	Morrisville,	Pa.	S. C. Pryor.
Moore, Frank Reynolds,	Clarksburgh,	W. Va.	H. L. Wells.
Moore, James Johnson,	Dillsburg,	Pa.	Dr. H. W. Fisher.
Morales, Guadalupe,	Nicaragua,	C. Am.	Dr. Morales.
Morgan, Julius Everard,	Smithfield,	N. C.	H. C. Blair's Sons.
Muhn, Harry Jacob,	Wheeling,	W. Va.	Ch. Menkemeller, Ph.G.
Mullen, J. A.,			
Murrell, Alexander Harrison,	Allen,	Md.	Dr. H. B. Taylor.
Myers, Arnold Armstrong,	York,	Pa.	J. H. Buckingham, Ph.G.
Myers, Henry Joseph,	Philadelphia,	Pa.	J. B. Cook.
Meyers, Louis Joseph,	Conshohocken,	Pa.	Eberly Bros.
Noon, Edward John,	Philadelphia,	Pa.	L. Genois, Ph.G.
Nusbaum, Benjamin,	Philadelphia,	Pa.	C E. Spenceley, Ph.G.
Otis, Amos Ray,	Hicksville,	Ohio	S. S. Loughridge, Ph.G.
Osborne, Albert Edgar,	Wallingford,	Pa.	Wardle Ellis, Ph.G.
Outen, Albert Petit,	Philadelphia,	Pa.	Daniel Follmer.
Parmer, Edward Elmer,	Camden,	N. J.	R. S. Justice.
Parvin, Harry Rocap,	Bridgeton,	N. J.	H. F. Seeley.
Paxson, Elmer May,	Philadelphia,	Pa.	H. James Batdorff, Ph.G.
Pazmiño, Francisco,	Machela,	S. A.	H. C. Manlove.
Pfeuffer, Willie, Otto, Robert,	New Braunfels,	Texas	Jno. N. Bodenman.
Phillips, Lehman Blew,	Bridgeton,	N. J.	Harrison Duffield, M.D.
Phipps, Amos Joseph,	Chestnut Hill,	Pa.	F. H. Poley.
Phipps, Claud,	Yuba City,	Cal.	
Portser, Charles Henry,	Saltsburg,	Pa.	Harry C. Watt.
Post, Francis Elmer,	Towanda,	Pa.	H. C. Lutz.
Prickitt, Charles Abram,	Mt. Vernon,	N. J.	B. T. Davis.
Prior, James Conrad,	Philadelphia,	Pa.	
Randal, Harry Lee,	Shepherdstown,	W. Va.	Charles C. Sanderson.
Randolph, B. Alfred,	Houston,	Texas,	E. L. E. Castleton, Ph.G., M.D.
Randolph, Thomas Owen,	Versailles,	Ohio	T. M. Newbold, Ph.G.
Raudenbush, Chas. Hunter,	Reading,	Pa.	Jacob H. Stein, Ph.G.
Reap, Edward Augustine,	Pottstown,	Pa.	Joseph Feldman.
Reif, Ernest,	Philadelphia,	Pa.	John A. Martin, Ph.G.
Remsen, John Edward,	Honesdale,	Pa.	J. F. Brody.
Reuss, William Henry,	Philadelphia,	Pa.	W. H. Morrett.
Riegel, Samuel Jacob,	Lebanon,	Pa.	Jos. L. Lemberger, Ph.G.
Rinedollar, Robert Grant,	Philadelphia,	Pa.	Wiley & Wallace.

Name.	*Place.*	*State.*	*Preceptor.*
Rinker, Francis,	Mt. Airy, Phil'a.	Pa.	J. A. Jeffries, Ph.G.
Robertson, John,	Mt. Carmel,	Pa.	Alva F. Tod, Ph.G.
Ruhl, Harry Fry.	Manheim,	Pa.	
Ruth, Solomon H.,	Sinking Springs,	Pa.	McCurdy & Durham.
Scarborough, George Walter,	Calvert,	Md.	Frank More, Ph.G.
Schaak, Milton Franklin,	Lebanon,	Pa.	G. W. Schools, Ph.G.
Scheirer, Franklin Benjamin,	Hokendauqua,	Pa.	W. O. Higgate, Ph.G., M.D.
Scheirer, Victor Daniel,	Allentown,	Pa.	Weber & Good.
Scherer, Bernhard Frederick,	Philadelphia,	Pa.	C. E. Haenchen.
Schmidt, Justus,	Dayton,	Ohio	N. T. James.
Schroeder, Martin Bernard,	Philadelphia,	Pa.	John A. Murtagh.
Scott, Robert Burns,	Philadelphia,	Pa.	Dr. J. W. Ranck.
Seltzer, Charles Jacob,	Coatesville,	Pa.	W. S. Young, Ph.G.
Shafer, Erwin Clement,	Montoursville,	Pa.	Dr. Geo. C. Saeger.
Sharp, John M.,	Philadelphia,	Pa.	E. W. Sharp.
Sharp, Warren Read,	West Chester,	Pa.	Wm. H. Lacey.
Sheehan, Edward Joseph,	Utica,	N. Y.	Stryker & Ogden.
Shore, Thomas Walter,	Philadelphia,	Pa.	J. O. Kooker, Ph.G.
Shull, Carl Whittaker,	Bridgeton,	N. J.	J. V. Slaughter, Ph.G.
Shuman, Calvin Bruce,	Bloomsburg,	Pa.	H K. Mulford, Ph.G.
Sickel, William Allen,	Bristol,	Pa.	Emlin Martin.
Siegfried, Howard Joseph,	Nazareth,	Pa.	E. B. Garrigues & Co.
Simmons, George Arthur,	Moores,	Pa.	F. E Harrison.
Simmons, Frank Waters,	Pottsville,	Pa.	W. A. Smith.
Singer, Robert Lamberton,	Harrisburg,	Pa.	Dr. E. A. Eyster.
Smith, Benjamin Franklin,	Harrisburg,	Pa.	Dr. J. H B. Amick.
Smith, Charles Adam,	Obold's P. O.,	Pa.	J. C. Griesemer.
Smith, Gilbert Slack,	Goshen,	N. J.	Dr. A. N. Tomlin.
Smith, Harry Allen,	Philadelphia,	Pa.	Van Buskirk & Apple.
Smith, Harry Clay,	Millville,	Pa.	Dr. H. C. Smith.
Smith, Herbert Johnson,	Elkton,	Md.	T. C. Tomlinson, M.D.
Solliday, William W.,	South Easton,	Pa.	Allen Spengler.
Speer, Edgar Lacey,	Chambersburg,	Pa.	J. S. Nixson & Son.
Spencer, Edward Thomas,	Newville,	Pa.	H. K. Mulford & Co.
Springer. Edward Franklin,	Wilmington,	Del.	J. M. Harvey, Ph.G.
Stein, Edward Theo. North,	Millersville,	Pa.	Wm. McIntyre, Ph.G.
Stem, Harvey Nevin,	Allentown,	Pa.	Heiberger & Stein.
Stiles, William Herbert,	Camden,	N. J.	Edward C. Jones & Co.
Stirling, David Clayton,	Philadelphia,	Pa.	S. C. Blair.
Stoffregan, Louis Franklin,	Pottsville,	Pa.	C. S. Commings, Ph.G.
Strode, William Alvah,	Elmira,	N. Y.	H. C. Blair's Sons.
Strouse, Theodore Herman,	Pottsville,	Pa.	H. F. Voshage.
Sultzbach, Harry Miller,	Marietta,	Pa.	A. D. Wike.
Swartly, Harry C.,	Norristown,	Pa.	Henry C. Blair's Sons.
Sweeney, Joseph Henry,	Mahanoy City,	Pa.	T. B. Bechtold.
Sweeney, Charles Washington,	Philadelphia,	Pa.	Wm. G. Toplis, Ph.G.
Taggart, George Corson,	Norristown,	Pa.	J. A. Ogden, M.D.
Taggart, Howard M ,	Philadelphia,	Pa.	C. H. Wagner.
Taylor Merle Hampton,	Butler,	Pa.	J. H. Parks.
Taylor, William Francis,	Cleveland,	Ohio	W. J. Huck.
Teeple, Harry Sutherland,	Campbell,	N. Y.	H. B. Willard.
Thompson, Oan Joshua,	Reading,	Pa.	J. M. Malatesta, Ph.G., M.D.
Thompson, Warren Ethelbert,	Wilmington,	Del.	
Tielke. Maxwell Gustav,	Cleveland,	Ohio	G. Tielke.
Truman, Elliot Davis,	Wells Bridge,	N. Y.	
Turner, Philip Percy,	Millington,	Md.	H. D. Diefenbeck.
Van Buskirk, Thos Franklin,	Bethlehem,	Pa.	S. L. Van Buskirk, M.D.
Voss, Frederick John,	Hanover,	Germ'y	Dr. Drueding,
Walls, John Henry,	Media,	Pa.	L. F. Tovar, M. D.

Name.	*Place.*	*State.*	*Preceptor.*
Walter, Andrew,	Philadelphia,	Pa.	W. F. Dugan.
Walmsley, James Winter,	Gloucester,	N. J.	Dr. Walmsley.
Waterall, Charles Albert,	Philadelphia,	Pa.	Wm. Waterall & Co.
Weber, Frank Charles,	Meadville,	Pa.	C. M. Zinck.
Weber, Frank Nicholas,	Millville,	N. J.	Geo. W. Weber, Ph.G.
Weisner, Nicholas Frederick,	Leesport,	Pa.	L. A. Podolski.
Westcott, Frank,	Media,	Pa.	W. E. Dickeson.
Weston, Geary Augustus,	Millersville,	Pa.	Dr. T. N. Reeder.
Whipple, Oscar Kellog,	Bridgeton,	N. J.	Geo. H. Whipple.
Whitaker, George Nixon,	Cedarville,	N. J.	C. H. Bateman.
White, Frank Willett,	Atchison,	Kan.	John W. Allen.
Williams, Clarence Edward,	Philadelphia,	Pa.	Bullock & Crenshaw.
Wissler, Arthur John,	Edinburg,	Va.	
Wolff, Oliver Brown,	Dry Run,	Pa.	Robt. McNeil, Jr.
Wollmuth, Richard Julius,	Bethlehem,	Pa.	J. J. Parker.
Wright, Thomas Edward,	Germantown,	Pa.	Bullock & Crenshaw.
Yarnall, John Winters,	Mt. Carmel,	Pa.	Geo. E. Dahis, Ph. G.
Zeamer, Harry Wissler,	Columbia,	Pa.	J. T. Shinn, Ph.G.
Zeller, John Paul,	Mifflinburg,	Pa.	T. J. Lightcapp, Ph.G.
Zerr, Samuel N. Z.,	Reading,	Pa.	P. M. Ziegler.
Ziegler, Albert Lewis,	York,	Pa.	S. M. Gable.

SENIOR CLASS.

Name.	*Place.*	*State.*	*Preceptor.*
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Allen, John Maskell	Salem,	N. J.	Jas. T. Shinn, Ph.G.
Alsentzer, Charles Frederick,	Wilmington,	Del.	F. Roop Smith, Ph.G.
Angeny, Ferdinand Gisler,	Doylestown,	Pa.	Harlan Cloud, Ph.G.
Apple, Franklin Muhlenberg,	Bangor,	Pa.	Milton S. Apple, M.D.
Appmann. William,	San Antonio,	Texas	Jno. W. Bodenmann.
Barnard, William Dwight,	Manistee,	Mich.	A. H. Lyman.
Barwig, Gustavus Adolphus,	Philadelphia,	Pa.	Dr. G. A. Bachman.
Baskin, Mortimer Horning.	Harrisburg,	Pa.	M. H. Bickley, Ph.G.
Belt, James Ferris,	Wilmington,	Del.	Z. James Belt.
Bender, John Jacob,	Shippensburg,	Pa.	S. S. Loughridge, Ph.G.
Benerman, Alan Herbert,	Philadelphia,	Pa.	H. C. Blair's Sons.
Bennum, Charles Henry,	Georgetown,	Del.	A. W. Duvall, M.D.
Berkemeyer, Francis Molton,	Kutz own,	Pa.	L. C. Berkemeyer, M.D.
Berkstresser, Watson J.,	Huntington,	Pa.	J. H. Black & Co.
Besore, Abraham Lincoln,	Shippensburg,	Pa.	U. D. E. Hayes.
Bickel, Harry Lee,	Felton,	Del.	F. E. Morgan, Ph.G.
Bilderback, Joseph Brown,	Pennsgrove,	N. J.	J. T. White.
Bilheimer, John Jessiah,	Bath,	Pa.	Dr G. P. Kern & Son.
Blackwood, Russell Thorn,	Bristol,	Pa.	J. R. Smyser, Ph.G.
Boecking, Carl Guido,	Tyrone,	Pa.	Saml. Gerhard.
Bolton, Joseph Peeky,	Germantown,	Pa.	Dr. J. M. Bradford, Ph.G.
Bonnell, Alexander Carhart,	Clinton,	N. J.	Dr. B. F. Severs.
Bowman, George McLeod,	Washington,	D. C.	C. B. Hunterson, Ph.G.
Bowman, John M.,	Philadelphia,	Pa.	F. W. Heyl.
Boyer, Allen Webster,	Allentown,	Pa.	W. E. Moyer, Ph.G.
Breisch, William H.,	White Haven,	Pa.	C. M. Driggs.
Brick, Harry Walter,	Fitchburg,	Mass.	Dr. Geo. M. Bowen.
Bright, William Willits,	Muncy,	Pa.	Watt & Leedom.
Brennan, John Thomas,	Philadelphia,	Pa.	F. M. Geary.
Buchanan, Frank,	Crum Lynne,	Pa.	C. H. Roberts, Ph. G.

Name.	*Place.*	*State.*	*Preceptor.*
Buehl, Edward Herman,	Massillon,	Ohio	E. S. Craig, Ph. G.
Bugg, Zack W.,	Blandville,	Ky.	S. J. Coffee, Ph. G.
Burgess, Frank Eugene,	Jefferson,	Ohio	Dr. E. H. Evans, Ph.G.
Burnett, James Howard,	Camden,	N. J.	L. B. Hirst, Ph. G.
Burnett, William Prescott,	Hackensack,	N. J.	John P. Burnett.
Butterworth, Francis James,	Lenni,	Pa.	Dr. C. L. Lashelle.
Cadmus, Alfred Brooks,	Philadelphia,	Pa.	F. J. Knauss.
Caldwell, Florence Moore,	Germantown,	Pa.	S. W. Caldwell, M. D.
Campbell, Clarence Henry,	Easton,	Md.	M. Campbell, Ph. G.
Carey, Wm. James,	Emporium,	Pa.	Dr. R. P. Heilman.
Carney, George Elmer,	Philadelphia,	Pa.	Hance Bros. & White.
Carriat, Louis, Michel,	Philadelphia,	Pa.	
Carritte, Clarence Edgar,	St. Paul,	Minn.	J. P. Carritte.
Cartwright, Benj. Franklin,	Philadelphia,	Pa.	Dr. Wm. Delker.
Casey, Harry English,	Philadelphia,	Pa.	Bullock & Crenshaw.
Cassiday, John Francis,	Philadelphia,	Pa.	W. H. Pile & Son.
Castle, Abraham Lincoln,	Upland,	Pa.	J. J. Parker.
Christ, Franz,	Philadelphia,	Pa.	John D. Moore, Ph. G.
Christman, Albert Samuel,	Allentown,	Pa.	E. J. Danowski.
Churchill, Jerome Percy,	Yreka,	Cal.	F. S. Ackerman.
Clabaugh, Edgar Michael,	Altoona,	Pa.	D G. Hurley, Ph. G.
Clapham, Benson Grant,	Mifflinburg,	Pa.	H. C. Clapham, Ph. G.
Codville, Harry Lawson,	Philadelphia,	Pa.	C. G. A. Loder, Ph. G.
Coley, Lemuel Belah,	Alexander City,	Ala.	E B. Rainey.
Coleman, Samuel,	Harrisburg,	Pa.	L. A. Dix.
Collings, Walter Nagle,	Philadelphia,	Pa.	D. W. Flemming.
Cook, Francis Wade,	Royersford,	Pa.	M. H. Bickley, Ph.G.
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Crothers, James Lawson,	Zion,	Md.	W. H. Lantz.
Cullen, James Kimmey,	Camden,	Del.	F. H. Davis.
Dalton, David,	Upland,	Pa.	D. Alfred Dalton.
Darling, Dwight Kellum,	Whatcom,	Wash. Ter.	H. H Sheik.
Davis, Alvah Molony,	Norristown,	Pa.	O. F. Lenhart, Ph. G.
Day, Frederick Samuel,	Philadelphia,	Pa.	Bullock & Crenshaw.
De La Cour, Joseph Carl,	Camden,	N. J.	J. C. De La Cour.
Dewees, Jacob Highley,	Norristown,	Pa.	Wm. Stahler.
Dierolf, Charles B,	Mt. Joy,	Pa.	Dr. J. F. Meade.
Dillon, Jr., Thomas Henry,	Philadelphia,	Pa.	Dr. J. M. Malatesta, Ph. G.
Donnell, George James,	Downingtown,	Pa.	G. E. Dennison.
Dubbs, Robert Lovine,	Allentown,	Pa.	S. Gerhard, Ph G.
Dunning, Fredk.,	Denton,	Md.	Dr. E. Q. Thornton, Ph. G.
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Duff, Peter Nicholas,	Dublin,	Ireland	S. Campbell, Ph. G.
Eberhardt, Ernest Godlove,	Indianapolis,	Ind.	Eli Lilly & Co.
Eberhardt, Wm. Fred.,	Fond du Lac,	Wis.	Ditter, Mitchell & Co.
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Engelman, Henry Shaffer,	Easton,	Pa.	Weaver & Hohl.
England, William Taws,	Philadelphia,	Pa.	Robt. England, Ph. G.
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Feidt, George David,	Hagerstown,	Md.	Chas. Ouram, Ph. G.
Finkeni, Wm. C.,	Camden,	N. J.	Dr. G. W. Henry.
Fletcher, Thomas Milton,	Little Rock,	Ark.	W. H. Haliburton.
Fraunfelder, Richard Deily,	Easton,	Pa.	A. Y. Gerhard & Co.
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French, Francis Freas,	Philadelphia,	Pa.	W. H. Koons, Ph. G.
Frontz, Edward Elmer,	Hughesville,	Pa.	Dr. W. C. Stillwell, Ph G.
Garland, John Kistler,	Centre,	Pa.	Dr. Van Cleef.

Name.	*Place.*	*State.*	*Preceptor.*
Gervais, Wm. Jos. Napoleon,	Elmira,	N. Y.	Dr. H. B. Taylor, Ph.G.
Gibble, Elmer Ellsworth,	Manheim,	Pa.	J. Howard Evans, M. D.
Gibbony, David Clarence,	Lisbon,	Iowa.	S. Kettering.
Gibson, Robert,	Shepherdstown,	W. Va.	O. H. Musser, Ph. G.
Gill, Charles A.,	Hulmeville,	Pa.	O. H. Musser, Ph. G.
Glenk, Robert,	Philadelphia,	Pa.	W. T. Baker, Ph. G.
Goll, Philip,	Philadelphia,	Pa.	W. J. Schaffer.
Gordon, Jean,	Walnut Hills,	Ohio	Wm. B. Gleim.
Gosh, William Edgar,	Danville,	Pa.	W. E. Mack
Gotwalt, Samuel Horace,	York,	Pa.	B. S. Gilbert, Ph. G.
Gracey, Archibald Alexander,	Philadelphia,	Pa.	W. B. Banks, Ph. G.
Griffith, Joseph Thomas,	Sassafras,	Md.	Dr. C. G. Frowert.
Guest, Harry,	Swedesboro,	N. J.	L. B. Hirst, Ph. G.
Hackenberger, Geo. Wash'gton,	Bainbridge,	Pa.	H. C. Blair's Sons.
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Hall, Marlborough,	Philadelphia,	Pa.	H. C. Blair's Sons.
Hallowell, Bruce Clyde,	Frankford,	Pa.	Geo. S. R. Wright.
Hamberg, Samuel Tilden,	Washington,	Pa.	J. F. Judd, Ph. G.
Hance, Edward Hance, Jr.,	Germantown,	Pa.	Hance Bros. & White.
Hanson, Arthur Edward,	Brazil,	S. A.	J. J. Ottinger, Ph. G.
Harbold, Curtis Alexander,	York,	Pa.	J. M. Ruegenberg.
Hasson, Harry Decora,	Phillipsburg,	Pa.	D. H. Ross, Ph. G.
Hendrickson, Chas Palmatary,	Dover,	Del.	Cowgill & Green.
Hennessy, Frank Augustine,	Charlotte,	Mich.	H. K. Mulford & Co.
Herbein, George Winters,	Sinking Springs,	Pa.	H. G. Haring.
Henkel, Luther Samuel,	Catawissa,	Pa.	E. H. Baker.
Hickman, Thomas Ellwood,	Lombard,	Md.	Wm. H. Hickman.
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Jacob, Charles Pim,	West Grove,	Pa.	Geo. B. Evans, Ph.G.
Jager, Charles Mathias,	Chattanooga,	Tenn.	F. H. Dowler & Co.
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Johnson, Frank R.,	Chester,	Pa.	G. Frank Wilson.
Johnson, William Anthony,	Philadelphia,	Pa.	Emil Jungmann.
Jones, W. Lincoln,	Catasauqua,	Pa.	
Judge, John Aloysius,	Philadelphia,	Pa.	Bullock & Crenshaw.
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Keller, Benjamin C.,	Manchester,	Iowa.	L. Atwater & Son.
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Knowles, George Alexander,	Philadelphia,	Pa.	W. D. Kerr.
Koons, Milton Henry,	Catasauqua,	Pa.	Edw. D. Boyer, Ph. G.
Krauss, Frederick,	Philadelphia,	Pa.	George Billé, Ph. G.
Kunkle, William Henry,	Salladasburg,	Pa.	F. P. Albright Ph. G.
Laessle, Henry Adolph,	Philadelphia,	Pa.	Dr. F. Seitz,
Lammer, Henry Bruno,	Philadelphia,	Pa.	Bullock & Crenshaw.
Lammer, Jacob Sigmund,	Philadelphia,	Pa.	F. J. Lammer, Ph. G.
Landis, Charles Paul,	Philadelphia,	Pa.	C. Petzelt.
Leigh, Charles Neal,	Coxsackie,	N. Y.	H. C. Manlove, Ph. G.
Lesher, Edwin Charles,	Berks,	Pa.	
Lippen, Jonathan Knight,	Salem,	N. J.	H. M. Levering.
Loelkes, Alexander George,	Belleville,	Ill.	E. Reuss.

Name.	*Place.*	*State.*	*Preceptor.*
Loesch, Jr., Wm.,	Philadelphia,	Pa.	W. E. Lee, Ph. G.
Long, Christian Charles,	Shippensburg,	Pa.	Dr. T. E. Conard, Ph. G.
Lowry, Sidney Alfred,	Yorkville,	S. C.	Lowry & Starr.
Lutz, Irwin Brennan,	Blainesport,	Pa.	H. G. Haring, Ph. G.
Lutz, Wm. Dellet,	Germantown,	Pa.	L. A. Treichler.
Mack, John Sandford,	Slatington,	Pa.	J. E. Williams.
Mackey, Edward Scudder,	Belvidere,	N. J.	Faust Bros.
MacWilliams, Samuel,	West Grove,	Pa.	Robt. Brick.
McCandless, Edward Sloan,	Philadelphia,	Pa.	H. S. Bartlett.
McClure, Linwood Dunham,	Philadelphia,	Pa.	Budd, Butterworth & McClure.
McCorkle, William,	Oxford,	Pa.	T. A. Walker.
McCullough, Madison Lovett,	Oxford,	Pa.	C. B. McCullough.
McManus, Joseph,	Upland,	Pa.	F. G. Ryan, Ph. G.
Martin, William Frederick,	Kansas City,	Mo.	J. C. B. Eager.
Marvill, Joseph Howard,	Philadelphia,	Pa.	J. F. Yealy, Ph. G.
Mentzer, Harlan Joseph,	Waynesboro,	Pa.	J. H. Fredericks, Ph. G.
Merkel, Wm.,	Minersville,	Pa.	Dr. J. M. Bradford, Ph. G.
Meyers, Quillas Albert,	Petersville,	Pa.	S. M. Hohl.
Miller, Wm. Edward,	Camden,	N. J.	H. W. Miller.
Miller, Wm. Haman,	Dover,	Del.	Dr. T. D. Marshall.
Miner, Mrs. M. O.,	Hiawatha,	Kansas.	Thomas Stevens.
Moor, Jr., Edward,	Media,	Pa.	S. E. R. Hassinger, Ph. G.
Moore, Wm. David,	Connelsville,	Pa.	J. C. Moore.
Morgan, George Irvin,	Lynn,	Mass.	F. E. Morgan.
Morrison, John William,	Amherst,	N. S.	R. C. Faller.
Mueller, Charles August,	Philadelphia,	Pa.	A. G. Keller.
Mulheron, John Dunaway,	Brownsville,	Tenn.	Jos. Crawford, Ph. G.
Murray, Emmett Leroy,	Americus,	Ga.	H. K. Mulford, Ph. G.
Myers, Frank,	Harrisonburg,	Va.	Bullock & Crenshaw.
Myers, William Tice,	Myerstown,	Pa.	C. C. Hagenbush.
Nichols, John Baugh,	Philadelphia,	Pa.	G. C. Webster, Ph. G.
Nickumn, Elwood George,	Bethlehem,	Pa.	Dr. C. B. Lowe, Ph. G.
Nolin, William Mosby,	Hannibal,	Mo.	DeGarris Bro.
Odbert, James Henry,	Wheeling,	W. Va.	T. H. Potts, Ph. G.
Ogden, Charles Sheppard,	Camden,	N. J.	W. F. Richards.
Peacock, Josiah Comegys,	Millington,	Md.	J. W. Kohlerman, Ph. G.
Pentz, John Flemming,	Easton,	Pa.	S. M. Hohl.
Perronet, Emile Alfonso,	Philadelpnia,	Pa.	T. M. Galbraith, Ph. G.
Pfeiffer, Charles Alfred,	Baltimore,	Md.	J. H. Evans, M. D.
Pfromm, Geo. Washington,	Philadelphia,	Pa.	D. S. Wittberger.
Platt, George Fisk,	Chambersburg,	Pa.	H. A. Newbold, Ph. G.
Porter, Crawford Washington,	Philadelphia,	Pa.	Robt. McNeil.
Prass, John Nicholas,	Dayton,	Ohio	W. H. Hyers.
Pratt, Wm. Henry,	Camden,	N. J.	L. H. Wilson.
Prior, Edwin Alfred,	Williamsport,	Pa.	M. Huber, Ph. G.
Proctor, J. Elliott,	Wooster,	Ohio	A. W. Blakman.
Ranftle, Oscar,	Long Island City,	N. Y.	W. E. Lee, Ph. G.
Raub, Fred. Miller Dickson,	Lancaster,	Pa.	Dr. W. M. Raub.
Rasmusen, Otto,	River Falls,	Wis.	C. E. Davis.
Read, Ralph Maynard,	Osceola Mills,	Pa.	Dr. F. B. Read.
Reese, David John,	Scranton,	Pa.	C. Carroll Meyer, Ph. G.
Reizenstein, Albert George,	Lebanon,	Pa.	Dr. Geo. Ross & Co.
Remington, Samuel Jacob,	Philadelphia,	Pa.	Stryker & Ogden.
Reynolds, May,	Philadelphia,	Pa.	A. M. Reynolds, M. D.
Rhodes, Charles Reynolds,	Orrstown,	Pa.	Wm. H. Faunce, Ph. G.
Richards, Davis Bruce,	Philadelphia,	Pa.	Wm. Weber.
Richardson, James Henry,	Charlestown,	Md.	L. R. Kirk, M. D.
Richardson, Harry,	Dover,	Del.	Dr. C. E. Hewitt, Ph. G.
Richter, Gustave Adolph,	Philadelphia,	Pa.	Dr. J. D. Grove, Ph. G.

Name.	*Place.*	*State.*	*Preceptor.*
Rohrer, Howard,	Lancaster,	Pa.	H. B. Cochran.
Rolleston, Arthur Raymond,	Philadelphia,	Pa.	Harry Cox, Ph. G.
Ross, Eben Jackson,	Oxford,	Pa.	Geo. Cooke.
Ross, H. Frank,	Russelville,	Pa.	E. W. Jester.
Roth, Theo. W.,	Philadelphia,	Pa.	Dr. G. H Ischler, Ph. G.
Rudy, Jacob Albert,	York,	Pa.	Dr. C. B. Lowe, Ph. G.
Ruff, U. Gilbert,	Bryansville,	Pa.	S. E. R. Hassinger, Ph.G.
Rutherford, Frank Parke,	Cochransville,	Pa.	G. P. Scheehle, Ph. G.
Sample, Joseph Frank;	Mechanicsburg,	Pa.	J. A. Shelly, Ph. G.
Sandifer, Myron Harry,	Sumter,	S. C.	J. F. Loerne.
Schade, George Julius,	Sandusky,	Ohio	O. F. Lohmann.
Schetky, Laurence Oliphant,	Mt. Holly,	N. J.	Bullock & Crenshaw.
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Schloer, Charles Albert,	New York,	N. Y.	W. D. Stevenson,
Schminky, Allen Beecher,	Gratz,	Pa.	Dr. C. D. S. Frûb, Ph.G.
Schoff, J. John,	Annapolis,	Md.	A. J. Corning,
Schoppe, L. A.,	St. Louis,	Mo.	
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Schultz, Albert,	Scranton,	Pa.	T. D. Lewis.
Schultz, G. Emile,	Chester,	Pa.	
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Shaw, Henry Burfield,	Canada.		M. Kratz, Ph. G.
Sheafer, Edward Parke,	York,	Pa.	G. E. Dahis, Ph. G.
Sheehan, John Peter,	Utica,	N. Y.	G. B. Evans, Ph. G.
Shomberg. Albert Frederick,	Altoona,	Pa.	G. A. Beckley.
Shreve, Joseph Frith,	Jacksonvllle,	Ill.	Jas. Williamson, Ph. G.
Sipe, George Walter,	Carlisle,	Pa.	G. D. Keller, Ph. G.
Sitgreaves, Wesley Cline,	Vincentown,	N. J.	F. S. Hilliard.
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Smith, Fred Harlow,	Springfield,	Mass.	H. & J. Brewer.
Smith, Frederick William,	Loudonville,	Ohio	Geo. Holland, M. D.
Smith, George Anselm,	Nazareth,	Pa.	B. C. Waterman, Ph. G.
Snuggs, Stephen Gregory,	St. Louis,	Mo.	H. F. MacCartney.
Sombart, Joseph Louis,	Coldwater,	Kansas	Dr. J. E. Sombart, Ph.G.
Sontag, George Lewis,	Neillsville,	Wis.	C. C. Sniteman, Ph. G.
Southerland, Thomas Raibe,	Wilmington,	N. C.	J. H. Hardin.
Spragle, Elmer,	Bartonsville,	Pa.	G. W. Barton.
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Spruance, James Harvey,	Smyrna,	Del.	O. C. Spear, Ph. G.
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Stettzer, Nathan Samuel,	Philadelphia,	Pa.	J. A. Martin, Ph. G.
Stewart, Abraham Lincoln,	Philadelphia,	Pa.	C. L. Young.
Stout, Oliver,	Philadelphia,	Pa.	J. L. Supplee, Ph. G.
Strohecker, Samuel Martin,	Reading,	Pa.	W. A. Burns, M.D.
Stroud, J. Geary,	Port Providence,	Pa.	D. G. Pot s.
Stimmel, Walter,	Wilmington,	Del.	Peter Stelman.
Swainbank, Harry Harlan,	Wilkesbarre,	Pa.	Matt Wolfe & Co.
Sullivan, Charles Edwin,	Wilmington,	Del.	Jas. M. Griffin.
Taylor, Harry Baker,	Altoona,	Pa.	E. L. Taylor.
Thompson, Charles Leonard,	Wilmington,	Del.	Jno. M. Harvey.
Thompson, Ebenezer Francis,	Titusville,	Pa.	E. R. Thompson.
Thompson. Wm. Franklin,	Harrisburg,	Pa.	G. A. Gorgas.
Thomson, Frank Frazer,	Carlisle,	Pa.	W. H. Llewellyn, Ph.G.
Tinsman, John Fine,	Bloomsbury,	N. J.	A. J. Odenwelder.
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Troutman, George Franklin,	Glen Riddle,	Pa.	Dr. C. L. Lashelle, Ph G.

Name.	*Place.*	*State.*	*Preceptor.*
Turner, Herbert Wilkinson,	Altoona,	Pa.	C. F. Randolph, Ph. G.
Tyler, George Cone,	Bristol,	Pa.	R. C. Cadmus, Ph. G.
Uhler, Samuel Elliott,	Carlisle,	Pa.	J. E. Sipe.
VanDyke, Alfred Nelson,	VanDyke,	Pa.	
VanValzah, John Adams,	Philadelphia.	Pa.	W. D. Heiser.
Venn, Joseph,	Memphis,	Tenn.	I. Goldbaum.
Visanska, Samuel Albert,	Abbeville,	S. C.	Given & Co.
Wallace, Harlan Lewis,	Seaford,	Del.	W. F. Haines & Co.
Watson, Hite,	Charlestown,	W. Va.	Geo. T. Light.
Warren, Nathan Chew,	Upland,	Pa.	Dr. C. L. Lashelle, Ph.G.
Weiler, John Wilson,	Emaus,	Pa.	H. B Taylor, Ph.G.
Weiss, Frederick Andrew,	Del Norte,	Col.	Weiss Chapman Drug Co.
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Williams, Daniel Albert,	Plymouth,	Pa.	B. Armstrong.
Williams, John Henry,	Slatington,	Pa.	W. O. Davies, Ph. G.
Williamson, James Strickler,	Norristown,	Pa.	Dr. Theo. Jacobs.
Wishart, John Elmer,	Harrisonville,	Pa.	J. B. Ferguson.
Wittel, John Kaler,	Florin,	Pa.	Leidy Seipel.
Wittiger, Hugo Otto,	Bethlehem,	Pa.	J. M. Shoffner, Ph.G.
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Wolf, Frederick Joseph,	Philadelphia,	Pa.	R. Shoemaker & Co.
Wolfenden, Benj'n Franklin,	Upland,	Pa.	W. Procter, Jr., Co.
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Wright, John Armstrong,	Philadelphia,	Pa.	A. W. Wright.
Yealey, Tilghman Wesley,	Camden,	N. J.	Jyhn W. Frey.
Yohn, Frank Gerrald,	Pottstown,	Pa.	John T. Hoskinson, Jr.
Zulich, Albert Augustus,	Schuylk'l Haven,	Pa.	W. D. Reynolds, Ph.G.

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ALGAROBIA GLANDULOSA.

By James Clavin, Ph.G.

From an Inaugural Essay.

Of the many various trees and shrubs, which go to make up our Southwestern sylva, there is none perhaps which deserves more, and few which have received less, notice at the botanist's hands than the mezquite of Texas and adjacent country. From personal observation and from information procured from various sources, I am enabled to refer to uses of the plant, which are not generally known. For much of the information I am indebted to Dr. V. Havard, of the United States Army, who has made an extensive study of the mezquite and its properties, uses, etc., both from a medicinal and economical standpoint.

The mezquite has been described as Prosopis juliflora by De Candolle; as Algarobia glandulosa in Torrey & Gray's *Flora*, and as Prosopis glandulosa by Torrey. The mezquite finds its home throughout Mexico and grows to some extent in South America. It flourishes to an enormous extent in the Southwestern territory of the United States, especially in Texas, where it covers countless acres of land and is by far the most common tree or shrub indigenous thereto. It is found in the Indian Territory and extends into California, following the Mexican border. It is very prolific, spreading rapidly and multiplying numerously wherever it takes root. It grows to a height of from 3 to 40 feet. Its branches are thorny and with deciduous foliage. The bipinnate leaves

occur singly or in clusters, armed generally at the base with a pair of straight whitish thorns. The compound leaf is from 4 to 7 inches long and bears from 8 to 15 pairs of leaflets, which are linear-oblong, 1 to 2 inches long and from $\frac{1}{8}$ to $\frac{1}{6}$ inch in width. The inflorescence is an axillary cylindrical, catkin-like spike, with a rather short peduncle and very fragrant. The flowers, on short pedicels, are polygamous, with a five-toothed calyx and 5 petals. The stamens are distinct, and 10 in number. Pistils have a villous ovary, truncate stigma and filiform style. The fruit consists of indehiscent legumes, 4 to 6 inches in length, compressed laterally and narrowing between the seeds, which are from 10 to 20 in number. These legumes occur in clusters, from 2 to 12 on the peduncle, and are of a light greenish-yellow, externally streaked with red, internally spongy, enclosing the seeds in separate casings. They form in Texas early in June, and through July and August the process of ripening goes on. In some dry localities they are mature before the last of June, while in other sections they could be hardly called so before the early days of September.

The leaflets have been used with great success in the treatment of inflamed eyes. They are also applied to inflamed surfaces in the shape of a poultice, and as such have their virtues. In the form of a hot infusion they are administered as a febrifuge in certain mild forms of fever. The leaflets are of an emerald-green color, a peculiar odor and a bitter, somewhat mucilaginous taste. The flowers have no medicinal uses that I have learned of. The legumes on the other hand possess properties which render them valuable. Whether they have any medicinal properties beyond that of a simple laxative is extremely doubtful, but they are economically of some considerable value. They are a first-class feed for cattle when ripe, and a plentiful crop of them is always produced no matter how dry and unpropitious be the season for products of tilled soil. They are rich in grape sugar and other nutritive principles, and are easy of digestion. When unripe though, they are apt to produce in horses and cattle the disease known as scours, a species of dysentery. A pleasant beverage, called by the Mexicans "atole," is made

from them; it is simply an infusion made by throwing the crushed ripe beans into boiling water, or by boiling them together, and afterwards straining. A fermented liquor, used to some extent in Mexico, is prepared in that country; the fruit easily undergoes alcoholic fermentation. Owing to the fact that the legumes are indehiscent and after falling to the ground are soon destroyed by insects, it is seen that the growth of the mezquite is not as dense or as easy of attainment as it would otherwise seem. The fact that these legumes are a favorite food of cattle and that their seeds always remain undigested and are passed in such a state in the fæces of cows and horses, will perhaps best explain the rapid extent of this hardy shrub or tree. An analysis made by Dr. Havard, yielded 26 per cent. of glucose, albumen and gum, traces of fats and salts were also found.

The wood, at the present time, is the most important product of the mezquite, for the reason that it furnishes in those regions, where it is indigenous, the great bulk of the fuel used; and because of its value as a timber which will stand the ravages of time. While a hard, fine-grained and easily polished wood, the fact that the centre of the trunk is often fissured, detracts considerably from its value in cabinet work. The most valuable quality is the bold front it opposes to decay, and striking proof of this is not wanting, for in the old missions and in numerous old Spanish houses these mezquite beams still support the stone roofs, though a century has passed since they were first set in place. Old hitching posts have withstood the winter's cold and summer's heat for over 25 years and are found still solid, even in the subterranean portions. This quality of the mezquite has been attributed to the tannin which it contains, and this constituent also makes it valuable as a material for tanning leather. This tannin resembles the nutgall tannin in producing the same inky precipitate with ferric salts. It is more plentiful in the heart wood than other portions of the plant. The reddish-brown heart wood is surrounded by a superficial layer of canary-yellow sap wood. Transverse sections of the wood show wavy concentric rings, the zones varying in color from yellowish to purplish-brown; the

medullary rays are so delicate as to be hardly visible to the naked eye. The line between the red and yellowish wood is distinct and abrupt and displays the sharp contrast in colors. The decoction of heart-wood chips is used in diarrhœa, and is a very valuable remedy in it and similar complaints. The bark of the mezquite is of a dirty silver-gray appearance externally, marked with whitish or somewhat lighter grayish patches in the young bark. That from older trees is seamed and deeply cracked or furrowed transversely and longitudinally and often found with mosses and various lichens adhering to it. Very young bark is of a smooth brown-gray appearance externally, somewhat striate and green beneath the thin epidermis. The bark interiorly is whitish, finely striate, very fibrous; the liber separates easily in thin layers. The transverse section of the bark shows a finely checkered appearance from the medullary rays and cork layers. The outer cork in old bark is brown and astringent to a slight extent. It yields its reddish coloring matter to water and dilute alcohol. The young and inner old bark are used as an astringent tonic, also in bowel complaint.

A peculiarity about the root of the mezquite is the immensity of its growth in those arid regions where the plant assumes such dwarfish proportions. In these regions the natives, as in the coal regions, dig for their fuel. The roots are found spreading to great distances and reaching into the earth to a depth of as much as 60 feet; in fact, wherever mezquite is found water can be procured by following its deep burrowing roots. This has been verified by the digging of wells along the Texas-Pacific Railroad. The amount of tannin in the root, from all indications, surpasses that of either the wood or bark. The amount of tannin in the wood is about between 6 and 7 per cent., this is in the heart wood. In the bark it is ·50 per cent., and in the white wood about the same. These figures are given out in an analysis made by the chemist of the Department of Agriculture. The bark is bitter, though not unpleasantly so, nor is the taste lasting.

The gummy exudation from the bark of the mezquite, has, perhaps, received more attention at the hands of scientists

than any other of the products. The gum is found to the greatest extent as an exudation from the cracked or artificially incised bark of old trees. In young trees the amount is very small, but of a lighter and much more handsome appearance, about the color of gum arabic. It exudes from the bark in the summer months, from May to September, and concretes in tears of various sizes, and ranging in color from straw-yellow to dark brown. The dark color, which has been the principal objection to the use of this gum, is undoubtedly acquired by contact with the reddish-brown outer bark, which imparts its soluble coloring matter to the gum while in its liquid state. The taste and slight astringency often found in dark specimens of the gum render this theory plausible. The gum whitens to some extent under exposure to the sun's rays. It is much superior to acacia in some respects, and were it not for the objections to its color, would, no doubt, come into extensive use; it possesses greater tenacity and is a better emulsifying agent than acacia. See also papers on "Gum Mezquite," by Wm. Procter, Jr., in AMER. JOUR. PHARMACY, 1855, pp. 14 and 223, and by H. J. Schuchard, in *ibid.*, 1885, p. 542.

GUARANA IN CHRONIC DIARRHŒA.

PHILADELPHIA, January 23, 1890.

To the Editor of the AMERICAN JOURNAL OF PHARMACY:

In looking over some old papers recently I found the following letter from Dr. J. Frazer Boughter, late of the United States Army, in reply to one of mine asking for the result of his experience in the use of Guarana powder. The very decided effect that he found it produced in a case of long-standing diarrhœa, leads to the inference that it is worth a more extended trial in that disease by the medical profession.

J. T. SHINN.

FORT CRAIG, N. M., July 22, 1875.

James T. Shinn, Esq., Philadelphia, Pa.:

DEAR SIR: Your note of 6th inst. with the box of Guarana powders received a few days ago, for which I am obliged. I will be happy to send you the results of any further trials I

may have the opportunity of making with it in case of chronic diarrhœa, etc. The case in question is that of a soldier of Co. F, 15th U. S. Inft., who for *two* (2) years has been troubled with chronic diarrhœa, better at times, at others worse; a great portion of his time in hospital. Has been in hospital now for over *two* months, becoming much worse, with *8* to *12* movements in *24* hours—all of them very offensive, containing mucus, blood, pus, etc., indeed presenting a dysenteric character. Nearly all the vegetable and mineral astringents were tried with only partial and temporary relief. The man rapidly lost flesh, became discouraged (so did I), when I happened to think of the Guarana which I had sent for—not for this case, but to use in a case of sick headache. I gave the man *one* powder *twice* daily for several days, and having only about *7* or *8*—afterwards *one* daily.

From the time of taking the first he began *at once* to improve, the number of passages from bowels diminished rapidly, and by the time the *7* or *8* powders were all taken he had but *one* passage in *36* hours or longer. To-day he is perfectly well and getting stout—eats fresh vegetables *well cooked*, and has about one passage in *36* hours. I must attribute his sudden change for the better to the Guarana, as I stopped all his medicine while taking it; since I have had him on dilute hydrochloric acid. The patient informs me that he has now the first *natural* movements of the bowels he has had for several years—nearly all of them heretofore being diarrhœtic in character.

I wrote the Post Surgeon of McKae, the next post to us, and suggested a trial of the Guarana, as they have many cases of diarrhœa there during the summer.

Very respectfully,

J. Frazer Boughter.

Arteries as Drainage Tubes.—Weeks (*Medical Age*, 1889, 380,) uses the arteries of oxen for the preparation of drainage tubes. The same are freed from adhering tissue, cut in pieces of suitable length, boiled with water for five minutes and drawn over glass rods of the requisite diameter. They are then laid for ten minutes in a 1 per cent. solution of corrosive sublimate and kept in 95 per cent. alcohol.

SOME CONSTITUENTS OF VERBASCUM, AMBROSIA AND LYCOPUS.

Abstracts from Theses.

Contribution from the Chemical Laboratory of the Philadelphia College of Pharmacy.—No. 65.

Adolph Latin submitted the leaves of *Verbascum Thapsus* to proximate analysis and found the constituents to be ·80 per cent. of a crystalline wax, a trace of volatile oil, ·78 per cent. of resin soluble in ether, 1·00 per cent. of resin insoluble in ether, but soluble in absolute alcohol, a small quantity of tannin, a bitter principle, sugar, mucilage, and the other usual constituents. The moisture in the air dried sample amounted to 5·90 per cent., and the ash to 12·60 per cent. He concludes that the plant contains many of the usual constituents and a bitter principle which may be prepared by exhausting the drug with alcohol, evaporating or distilling the solvent, dissolving the residue in water and agitating with ether or chloroform. Several trials failed to secure this substance in a crystalline condition. It was found to be soluble in water, ether, alcohol and chloroform and to possess a decidedly bitter taste. It responded to none of the tests for a glucoside or alkaloid.

Leslie W. Schwab examined *Ambrosia artemisiæfolia*, popularly known as Ragweed, Hogweed or Bitterweed. This plant is indigenous to all parts of the United States, the droughts of the Western States are never so severe as to prevent it flourishing along waysides and waste places and in the locality of the author (Central Illinois) the crop never fails whether it be a wet or dry season. Its average height is from 2 to 3 feet. All parts of the plant are very bitter, hence the common name. The material for analysis, consisting of the leaves and smaller stems, were gathered in August.

The bitter principle was found to be a glucoside, which was partly dissolved from the plant by ether, but more completely by alcohol. On recovering the solvent, dissolving in water and agitating with ether or chloroform the bitter glucoside was obtained in an amorphous condition. The following is a summary of the constituents found :

	Per Cent.
Volatile oil,	0·10
Fat melting at 60° C.,	1·80
Wax melting at 68° C.,	0·08
Resin, Chlorophyll and Glucoside,	2·78
Gum and Mucilage,	1·61
Dextrin and Glucose,	2·89
Saccharose,	1·97
Albuminoids,	1·87
Pectin,	2·42
Incrusting substance,	17·78
Lignin and Cellulose,	51·19
Ash,	9·25
Moisture,	6·26
	100·00

Joseph L. Weil analyzed *Lycopus virginicus* and found it to contain 0·41 per cent. of a fat melting at 50° C., 0·68 per cent. of a granular wax melting at 70° C., a small amount of gallic acid, 0·43 per cent. of a crystallizable resin soluble in ether, chloroform, benzol and slightly soluble in 95 per cent. alcohol, a small quantity of tannin, a crystallizable glucoside and the usual plant constituents.

The crystalline glucoside may be obtained by extracting the drug with ether, recovering solvent and treating residue with water which removes the glucoside, from which it may be removed by agitation with ether. Alcohol may be used instead of ether to exhaust the drug. The glucoside decomposes so readily that it is difficult to obtain pure, the products of decomposition being an amorphous resin-like body and glucose.

The crystalline resin can be obtained in the same extraction with ether. After the removal of the glucoside from the ethereal extract by water, the resinous residue when dissolved in hot absolute alcohol, will in part deposit as crystals, which soften at 113° C., but refuse to melt at 200° C.

The drug is used almost exclusively by the Eclectics.

Resorcin in Whooping Cough.—Dr. Andeer (*Centralbl. f. Med. Wiss.*) employed resorcin successfully in the complaint named, giving to children half a wineglassful of a 2 per cent. solution in water, of which a portion was directed to be used as a gargle.

EUPATORIUM PURPUREUM.

By Henry Trimble.

Contribution from the Chemical Laboratory of the Philadelphia College of Pharmacy—No. 66.

In the American Jour. Pharmacy, 1876, p. 331, appears the following paragraph in the minutes of the Pharmaceutical Meeting: "Prof. Maisch donated —— from J. U. Lloyd a specimen of a yellow neutral crystallized principle obtained from the root of *Eupatorium purpureum.* It is quite soluble in hot, slightly so in cold alcohol, and insoluble in water; does not unite with dilute acids, is decomposed by strong sulphuric acid, is tasteless, and as far as known has no medicinal value."

This statement has frequently attracted my attention, and is evidently the origin of the remark in the *National Dispensatory* (3d edit., p. 598), that such a principle exists, and that it is probably identical with *quercitrin.* I, therefore, determined to investigate the whole subject, and in the summer of 1887 collected some of the leaves of the above plant, and had them analyzed by F. M. Siggins, Ph.G.,[1] who failed to find any unusual plant constituents. Especial attention was given to find the above-mentioned crystalline compound, and had we then possessed the information I now have concerning it, the result might have been different.

In the summer of 1888, I collected a quantity of the rhizomes with attached rootlets, and they were analyzed during the following winter by G. Herbert Ray, Ph.G., and the results presented in a graduation thesis.

Mr. Ray's investigation was very carefully conducted, and the results I consider very accurate, although, for reasons that will be given later, he failed to find the crystalline compound. The following is a full abstract of his paper which has not previously been published.

Purple Boneset, Trumpet Weed, Gravel Root or Queen of the Meadow, as might be supposed from its botanical name, has some purple characteristics, and these are found in its purplish colored stem and flowers. The rhizome and rootlets

[1] Am. Jour. Pharmacy, 1888, p. 121.

are the parts used medicinally, and therefore have been the parts examined.

No description of the drug appearing in print, it is thought advisable by the writer that such should be given.

The plant is found growing abundantly in low places, and attains a height of from three to twelve feet and even more. The rhizome is horizontal, one to four inches long, one-half to three-fourths of an inch in thickness, and with many thin, rather tough rootlets. It is brownish-black externally, yellowish internally, and breaks with difficulty. The medulla is darker than the other portions, the odor slight but peculiar, taste bitter, bark thin and the word wedges about twenty-six in number, but not as wide as the medullary rays. The rootlets are lighter in color, four to eight inches long, with a thick, easily removable bark, inclosing a tough central cord.

The drug in very fine powder yielded to petroleum ether 0·89 per cent., consisting of volatile oil 0·07 per cent., fat melting at 60° to 63° C., 0·53 per cent., and wax melting at 100° C., 0·29 per cent.

Stronger ether extracted only 0·25 per cent. from the residual drug, this was insoluble in water, but consisted of a yellow resin-like uncrystalline substance, which gave negative results with tests applied for quercitrin and quercetin. The melting point of this ethereal extract was 72° C.

From the remainder of the drug absolute alcohol extracted 1·10 per cent., most of which was soluble in water. Both the soluble and insoluble portion failed to respond to any tests for quercitrin or quercetin. Glucosides, alkaloids, gallic and tannic acids were shown to be absent. The portion insoluble in water somewhat resembled the ethereal extract, although it required a temperature of about 100° C. to melt it. Alcoholic solution of lead acetate failed to produce any reaction in an alcoholic solution of this portion not dissolved by water, or in that of the ethereal extract. The remainder of the analysis is best quoted by giving the following summary:

	Per Cent.
Volatile oil,	0·07
Fat,	0·53
Wax,	0·29
Yellow resin dissolved by stronger ether,	0·25
Soluble in absolute alcohol,	1·10
Mucilage,	2·76
Dextrin,	2·88
Saccharose,	2·04
Glucose,	2·29
Albuminoids,	1·36
Other organic matter soluble in dilute alkali,	2·34
Calcium Oxalate,	1·82
Incrusting substances,	5·15
Cellulose and lignin,	54·80
Ash,	14·90
Moisture,	7·74
	100·32

A small quantity of organic acid found in the aqueous extract of the drug proved to be citric acid. The author concludes by stating that the rhizome is peculiar for the large percentage of cellulose contained in it, and for the small amount of material extracted by the usual solvents, and that the only evidence of a crystalline principle is resin capable of assuming a granular form, but which in no way responds to the tests for quercitrin or quercetin.

Mr. Ray's conclusion regarding the crystalline principle would, no doubt, have been different, had he operated on a larger quantity of the drug, which would have allowed him to recrystallize the granular resin and so obtain it in the acicular form. The amount operated on was 50 grms., but 200 or 300 grms. were afterward exhausted with absolute alcohol, but additional material, which in the original analysis was removed by ether and petroleum ether, being present prevented the purification of what was still a small quantity.

While hesitating about publishing Mr. Ray's results, I was shown some crystalline substance by Mr. E. G. Eberhardt, a student of this college, who, while recently in the employ of Eli Lilly & Co., Indianapolis, obtained it from a sediment in a fluid extract of the above-mentioned drug.

As Prof. Lloyd is the discoverer of the compound, he was communicated with and immediately forwarded a freshly pre-

pared sample, followed somewhat later at my request by this report:

"Concerning the yellow crystalline principle of *Eupatorium purpureum*, I will say that it was first obtained by me between the years 1870 and 1875, I cannot give exact date of discovery. For some time it remained a private cabinet specimen only, but finally I forwarded a sample to Prof. Maisch for his cabinet, and he donated it to the Philadelphia College of Pharmacy."[1]

"This material belongs to the class of organic bodies that, after once having been separated from natural associations, present marked characteristics, but which persistently refuse to assert to their individualities while in the society of accompanying extractives. Hence, in endeavoring to crystallize it from any natural extractive liquid, the experience of the investigator is discouraging, for it assumes an amorphous condition as a part of the extractive, and redissolves when the extractive matter is dissolved without exhibiting itself, even to the microscopist.

"In order to prepare it, I employ the principle that I have learned is often desirable in liberating plant constituents, *i. e.*, the preliminary separation of extraneous extractives and then crystallization of the desired substance from an appropriate menstruum. Under these conditions the principle under discussion is easily developed, and afterwards exhibits a marked separate existence, being indeed characterized by a strong tendency to separate in beautiful crystalline tufts immediately upon the reduction of temperature of its hot alcoholic solution.

"*Preparation.*—Exhaust finely ground or powdered root of *Eupatorium purpureum* in a menstruum composed of three parts of alcohol and two parts of water. Evaporate the percolate to the consistence of thick honey, and pour it into cold water, stirring well. After a day (or when the dark-colored precipitate has subsided) decant the overlying aqueous solution and wash the precipitate with a fresh por-

[1] This specimen is still in the College Museum and was, with the other crystals, exhibited at the reading of this paper.

tion of cold water, and dry it. Then boil this insoluble substance in an appropriate amount of officinal alcohol, filter and upon cooling the substance separates in brownish-yellow crystals. The crystals should be purified by recrystallization from hot alcohol, when they assume a deep yellow color.

"The precipitate that sometimes collects in fluid extract of *Eupatorium purpureum* usually contains a considerable proportion of this substance. In the course of time, a large container of such a fluid extract forms (as other liquids also do) zones of different gravities and different compositions. At one of the lines, under these circumstances, the substance reaches a crystallizable condition, or a freedom from associates, that permits it to assume a crystalline form, and it shoots into existence in masses often of large crystals. These formations are likely to form a belt near the *top* of the liquid and on the coolest portion of the container.

"Concerning a name, since both names of the plant have been appropriated (*purpurin* from madder and *eupatorin* from boneset), it seems difficult to formulate a name in the usual manner (denoting its origin) without creating confusion. If your chemical examination does not determine it to be identical with *quercitrin* (which I doubt), and if it is not possessed of characters in a chemical sense that will permit you to give it an acceptable name therefrom, it might be well to affix a name combining the generic and specific names of the plant, for example, *Eupapurin*, or, indeed, the briefer name *Euparin* might be better."

Under my direction Mr. Eberhardt made an investigation of the two samples, which he found to be identical.

The purification of the yellowish brown mass was accomplished by repeatedly dissolving in hot absolute alcohol and allowing to crystallize. By this treatment the crystals became more distinctly acicular, and of a lighter yellow, but with a decided brownish shade. A portion was then taken, and, after solution in warm alcohol, digested with animal charcoal, which resulted in a bright lemon-yellow product, although, as will be seen, without materially changing the composition.

These crystals both before and after treatment with animal

charcoal, melted at 117·2° C., at a higher temperature they decomposed and burned without leaving any residue. They were found to be insoluble in water, sparingly soluble in petroleum ether, easily soluble in ether, chloroform, benzol, carbon di-sulphide and boiling alcohol. They dissolved in strong aqueous solutions of potassium or sodium hydrate, but separated unchanged on the addition of a small quantity of water.

They were not affected by concentrated hydrochloric acid or nitric acid; conc. sulphuric acid dissolved them with a dark red color, changing to bluish green.

The crystals from Eli Lilly & Co., after purification from hot alcohol, gave the following when submitted to elementary analysis:

I, ·1982 gram substance gave ·5162 gram CO_2 and ·0985 gram H_2O
II, ·2197 " " ·5735 " " ·1049 " "

	I. Per Cent.	II. Per Cent.
C,	71·03	71·17
H,	5·52	5·30
O,	23·45	23·53
	100·00	100·00

The sample from J. U. Lloyd, after a similar purification, yielded the following:

I, ·2276 gram substance gave ·5915 gram CO_2 and ·1104 gram H_2O
II, ·2132 " " ·5526 " " ·1053 " "

	I. Per Cent.	II. Per Cent.
C,	70·88	70·69
H,	5·39	5·48
O,	23·73	23·83
	100·00	100·00

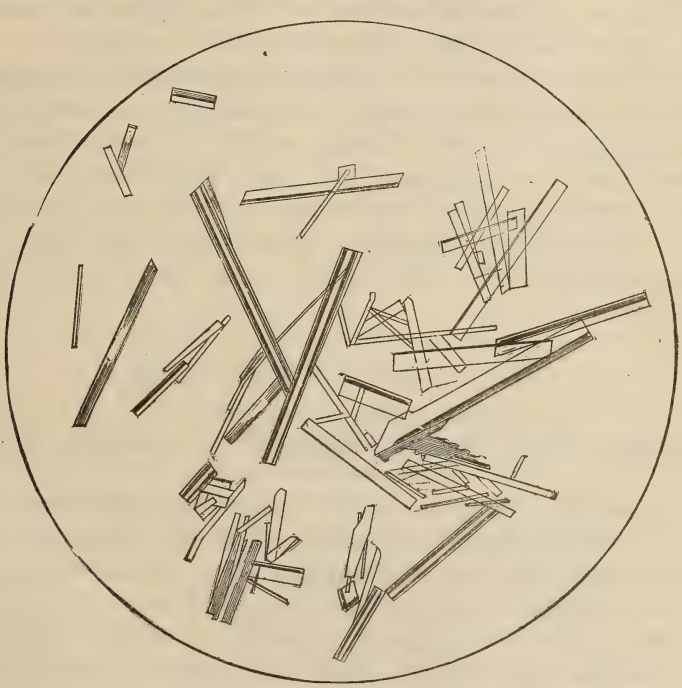
One of the samples was then taken and purified by animal charcoal, which yielded a product so much brighter in color that a combustion was made in order to determine if a chemical change had taken place.

The following results show that no material difference occurred:

I, ·2014 gram substance gave ·5241 gram CO_2 and ·0930 gram H_2O
II, ·2143 " " ·5596 " " ·1004 " "

	I. Per Cent.	II. Per Cent.
C,	71·00	71·25
H,	5·13	5·20
O,	23·87	23·55
	100·00	100·00

The crystals obtained by this purification with animal charcoal appeared in acicular tufts when viewed by the naked eye, but under the microscope were found to have the more prismatic form shown in the accompanying figure.



A few more elementary analyses were made of this substance, amounting to ten in all, the average of which gave the following percentages and formula:

	Average of 10 Analyses. Per Cent.	Calculated for ($C_{12}H_{11}O_3$). Per Cent.
C,	70·98	70·94
H,	5·41	5·42
O,	23·61	23·64
	100·00	100·00

It is evident from the above analyses and reactions that this compound is not quercitrin or quercetin. The only known compound that it resembles is vulpinic acid, but even this is excluded by its composition. In order to determine if the new substance possessed any acid properties, it was treated with a concentrated solution of potassium hydrate, which dissolved it, but allowed it to precipitate on the addition of a small quantity of water. The precipitate was shown to have the same composition as the original material by washing and then submitting it to an ultimate analysis, which gave results very close to the above average.

It is scarcely possible, therefore, to classify this compound among the acids, consequently the adoption of one of the names proposed by Prof. Lloyd would be a convenience.

The first one suggested by him resembles that of an eclectic preparation, so the second one "*Euparin*" is offered, with the hope that, having a name, this compound, after being dormant for nearly twenty years, may attract other investigators.

WINE OF BEEF AND IRON.

By E. G. Eberhardt, Ph. G.

Contribution from the Chemical Laboratory of the Philadelphia College of Pharmacy—No. 67.

It is not the purpose of this paper to demonstrate the quality of this preparation as found in the market, for that would necessitate the examination of a larger number of samples than the available time has permitted. The object is rather to give an outline, if possible, of a method for its examination. It is well known that much of the so-called beef, iron and wine is of uniformly poor quality, while the remainder is perhaps as good as the existing conditions and the exacting palate of the consumer will permit. Leaving aside the question of its nutritive value we will consider the matter from a pharmaceutical point of view. The claim of the larger manufacturers is that in each fluid ounce are contained 4 grains of citrate of iron and ammonium and the equivalent of two ounces of fresh beef dissolved in a good quality of sherry wine. The price at which the article is

sometimes sold warrants the suspicion that in many instances a very cheap wine is used. As to the extract of beef, Hager states that 10·0 of extract and 250·0 of fresh beef are considered equivalent and on this basis the fluid ounce then should contain about 38 grains of the extract. In making the preparation we find that the latter is not completely soluble in the wine and on standing precipitation continues for a considerable length of time. A manufacturer may thus send out a quantity in good condition but by the time it reaches the dispenser or consumer it contains an unsightly precipitate. To obviate this, some seem to adopt the very radical and economical method of leaving out the beef. Others put in as much as they safely can and bravely face any complaints, or again it is stored away until precipitation ceases before being put upon the market. In one instance that has come under the author's notice the maker evidently diluted the wine—perhaps to furnish a better solvent—and finally forgot to put in the beef. These remarks must not be understood as applying solely to the large manufacturers, but also to the many smaller firms and individuals that make a specialty of this preparation.

While it is comparatively easy to estimate the iron it becomes a matter of extreme difficulty to determine with exactness the quantity of beef in such a mixture. An approximate estimation, however, of the quality of a sample can be made with the ordinary apparatus of the laboratory.

In the samples under examination determinations were made of the specific gravity, of alcohol, solids, ash, iron, phosphoric acid, the amount insoluble in alcohol and its ash and total nitrogen. I will briefly outline the methods used.

The specific gravity was taken with the bottle at 20° C., this temperature being adopted as more convenient.

The percentage of alcohol was determined according to the method of the Pharmacopœia, and where the quantity at hand was sufficiently large, a definite volume was distilled, both distillate and residue made up to the original volume and the alcohol calculated from their respective specific gravities, taking the mean of the two results, as recommended by Allen.

Solids were estimated by evaporating a definite volume (20 cc.) in a platinum capsule and drying the residue at 110° C., until the loss did not exceed a milligram per hour.

This residue, by incinerating to a constant weight, yielded the ash.

From a solution of the latter in dilute hydrochloric acid, the iron was precipitated as hydrate by ammonia. After thoroughly washing, the precipitate was redissolved, in hydrochloric acid and precipitated a second time by an excess of potassium hydrate to separate any alumina present. This precipitate collected, washed, dried and ignited, yielded the iron as Fe_2O_3. The presence of phosphates did not interfere, as was proven by precipitating the iron in a parallel experiment as basic acetate.

Phosphoric acid was estimated in the ash by precipitating it from a solution of the latter, first as ammonium phosphomolybdate and subsequently from the ammoniacal solution of the latter as ammonium magnesium phosphate. This precipitate was collected, washed, dried, ignited, and the residue weighed as $Mg_2P_2O_7$, calculating therefrom the phosphoric acid.

To determine the amount insoluble in alcohol 25 cc. were evaporated on a water-bath to 5 cc., and 50 cc. of strong alcohol added while stirring. When allowed to stand sufficiently long, it was found that the precipitate deposited on the sides and bottom of the beaker, so that the clear liquid could be decanted. When not perfectly clear, the liquid was filtered and the beaker then carefully rinsed with a little alcohol, passing the washings through the same filter. Any residue on the filter was then washed back into the beaker with a little distilled water, and the entire precipitate—in most cases completely soluble—transferred to a platinum dish. The solid matter and finally the ash were estimated in this as above.

The total nitrogen was determined by Varrentrapp and Will's method of heating in a closed tube with soda lime, absorbing the NH_3 generated in a measured quantity of standard acid, and then titrating the latter with standard alkali. Every cc. of normal acid neutralized by NH_3 is

equivalent to ·014 of nitrogen. Normal solutions of oxalic acid and sodic hydrate were employed.

In order to make more accurate comparisons, two samples of beef extract, designated in the table below as A (Liebig's) and B (Armour's) and one of imported sherry wine, C, were examined in connection with the beef, iron and wine. Of the latter, D was made by a local pharmacist, E by a well-known manufacturing house and F by the author, making it to conform as nearly as possible to the formulas given by the manufacturers; D was purchased directly from the maker and E was obtained in the open market. The results of the investigation were as follows:

Sample.	Specific Gravity.	Per Cent. Alcohol by Weight.	Per Cent. Solids.	Per Cent. Ash.	Per Cent. Iron. Fe_2O_3.	Per Cent. Phosphoric Acid.	Precipitated by Alcohol.		Per Cent. Nitrogen.
							Per Cent. Solids.	Per Cent Ash.	
A,	—	—	79·41	17·88	—	—	31·8	12·68	8·14
B,	—	—	81·75	17·94	—	—	30·	12·38	7·06
C,	·9922	16·9	3·634	·396	—	·032	·655	·364	—
D,	1·0039	2·58	1·953	·184	·160	·012	·877	·139	·025
E,	1·0378	15·7	11·856	·975	·304	·015	6·150	·689	·148
F,	1·0246	13·77	9·645	2·159	·197	·082	4 638	1·400	·765

On comparing the sensible properties of D, E and F, it was found that F had a light amber color, somewhat darker than the wine of which it was made, and a pronounced taste and odor of extract of beef. E was of the same color, but had a decidedly more pleasant odor and taste, containing, as it did, sugar and flavoring material. D was darker than the other two, its color being suggestive of caramel. It had also an aromatic odor and a bitter taste, becoming toward the last somewhat ferruginous. The bitter taste was probably due to gentian. That it was not due to alkaloids was proven by experiment. On looking at the table, we see that in this

particular sample the specific gravity was very low; the percentage of alcohol from one-fourth to one-fifth of what it should be, total solids and ash one-half as much as found in simple sherry wine and the amount of nitrogen yielded was well within the ordinary limit of error. The claims made for this article are very comprehensive, but too indefinite to merit attention.

The figures obtained from sample E show at once that it contains some beef; not as much, however, as the claim would warrant as can be seen by comparing with results from sample F. The former contains a little over 2, the latter about 8 per cent. of the extract. The larger amount of solids in E is accounted for by the presence of sugar. Its percentage of ash is less and of iron greater than in F, showing that the larger portion of the solids are material other than beef. I may state here that D represents the very poorest quality, E a fairly good article and F a standard preparation, according to the claims of the manufacturers.

Both wine and extract of beef vary in their percentage composition. According to Hager, extract of beef contains 19–22 per cent. of moisture, leaves 15–22 per cent. of an ash containing 27–37 per cent. of phosphoric acid, and yields 6–8·5 per cent. of nitrogen. Wine, according to the same authority, yields ordinarily 1·5–5 per cent. extractive, ·2–·4 per cent. of ash and ·015–·060 of phosphoric acid. This variation occurs not only between different brands, but between different lots of the same brand, depending in extract of beef upon the condition of the source and process of manufacture, while in wine we have the additional influence of age. Under such circumstances it is impossible to make any accurate deductions. The most reliable indications are afforded by the estimation of nitrogen and ash, and the percentage of these decreases as precipitation in the preparation continues, *i. e.*, as it becomes older.

Phosphates are readily precipitated by alcohol, and, besides, both wine and extract show a fairly wide range of variation in them, so that their estimation seems of no particular value.

Precipitation by alcohol yields no better indication than the

simple estimation of ash, but is of value as corroborative evidence.

The presence of ammonia in the iron salt slightly increases the yield of nitrogen (nearly ·015 for every ·100 of Fe_2O_3) so that about ·09 gm. correspond to one per cent. (1 gm.) extract of beef. This would give for E 1·65 and for F 8·5 per cent. of extract.

Deducting from the ash the percentage of ferric oxide plus ·2 (per cent. of ash in wine), and multiplying the remainder by five (extract of beef leaves about one-fifth to one-sixth its weight of ash) we get a product approximating the percentage of beef. For E the result is 2·35, for F 8·81 per cent. Both are slightly above but very near the truth.

As to the quality of the wine employed we have no safe criterion. The alcoholic strength and general physical properties being the only indication in this respect.

A wine of beef and iron of standard quality should contain from 12–16 per cent. of alcohol, 10 per cent. and upwards (not exceeding 12) of extractive, yield about 2 per cent. of ash, ·2 per cent. of Fe_2O_3, and from ·5–·75 of nitrogen. About one-half of the solids and two-thirds of the ash should be found in the portion precipitated by alcohol. Any sample yielding much less than 1 per cent. of ash and ·15 per cent. of nitrogen can be safely put down as containing very little beef.

In conclusion, the process of examination can be summed up as follows:

1. Note physical properties, color, odor, taste.
2. Determine the percentage of alcohol.
3. Determine total solid constituents.
4. Incinerate a portion and determine the amount of ash.
5. Estimate the amount of ferric oxide present.
6. Precipitate a portion by alcohol and estimate the percentage of solids precipitated and their ash.
7. Make an estimation of nitrogen.

Adulterated Saffron.—Et. Ferraud (*Revue Internat. des Falsificat. des Denrées aliment.*, 1889 (3), 42–43) noticed a saffron yielding 26 per cent. of ash, composed to the greatest part of barium sulphate, and containing 11–12 per cent. of honey and a coloring matter, probably an azo color.

GLEANINGS FROM THE GERMAN JOURNALS.

By Frank X. Moerk, Ph G.

Diuretin is the name under which a soluble salt of *theobromine* is placed upon the German market; *theobromine-sodium salicylate* is its composition, and it contains 50 per cent. theobromine. It forms a white powder, soluble in less than half its weight of warm water without precipitating after cooling (theobromine is soluble in 1,600 parts of water). The powder as well as its solution should be preserved in well-corked vials. It is given in single doses of one gram each, the daily dose being six grams; diuretin is characterized by its direct action upon the kidneys, and has been found useful in kidney and heart affections in which digitalis and strophanthus failed to act.—*Apotheker Ztg.*, 1889, 1338.

The presence of *Aloes* in *Fluid Extract of Cascara sagrada*, has been the subject of an investigation by Ludwig Reuter, who recommends Klunge's cupraloin reaction as the best means of detecting the adulteration: 10 to 20 drops of the extract are evaporated to dryness in a watch crystal, the residue mixed with cold water and the aqueous solution filtered: to the filtrate are first added a few drops of copper sulphate solution, then a little sodium chloride solution, and finally, a few drops of alcohol, a violet-red coloration indicating the presence of aloes.—*Pharm. Ztg.*, 1889, 745.

Exalgin or methylacetanilid $C_6H_5N(CH_3)C_2H_3O$ is prepared by the action of acetylchloride C_2H_3OCl upon monomethylaniline $C_6H_5NHCH_3$ there being also produced methylaniline chlorhydrate $C_6H_5NHCH_3,HCl$. It is obtained in white crystals melting at 100°, boiling at 245° C., easily soluble in alcohol, difficultly soluble in water. Among its tests may be noted: (1) If exalgin be boiled with solution of potassium hydrate, allowed to cool, diluted with water and a little fresh chlorine water now added, the solution becomes transiently cloudy, then for one to two minutes colorless, after which it assumes a pure blue color; acetanilid in the same manner forms an orange-red color. This test allows the detection of acetanilid in exalgin. (2) The simplest test by which exalgin can be distinguished from acetanilid, phenacetin and methacetin depends

upon the solubility in HCl and the behavior upon addition of concentrated nitric acid: 0·1 gram exalgin dissolves easily in 1 cc. concentrated HCl (phenacetin is insoluble) and is not reprecipitated (acetanilid); the solution should remain colorless on addition of one drop of concentrated nitric acid (methacetin causes a red-brown coloration).—E. Ritsert, *Pharm. Ztg.*, 1889, 754.

Methysticin, the crystalline principle present in the root of Macropiper Methysticum and prepared by extraction with boiling 80 per cent. alcohol, allowing to cool and repeatedly crystallizing the crystals obtained from 70 per cent. alcohol, has the following properties, according to Dr. C. Pomeranz: White silky prismatic needles, odorless and tasteless, melting at 137° C; insoluble in cold water, slightly soluble in hot water, petroleum ether and ether, more soluble in cold alcohol, chloroform and benzol; the best solvent is boiling alcohol; it is not volatile, decomposing on heating with evolution of aromatic yellow vapors; with concentrated sulphuric acid it colors purplish-violet. Methysticin does not contain nitrogen having the formula $C_{10}H_{14}O_5$ and is the methyl ether of methystic acid $C_{14}H_{12}O_5$; the statement is contradicted that by its oxidation benzoic acid is formed.—*Pharm. Post*, 1889, 910.

Lard Substitutes for Ointments.—(1) Lanolin 65 parts, paraffin oil 30 parts and ceresin 5 parts. (2) Anhydrous lanolin 35 parts, vaselin 53 parts, white ceresin 7 parts and distilled water 5 parts. The latter preparation is known as "Unguentum medicinale" or "Adipatum," and is useful in preparing stock ointments (rancidity being impossible) and in making ointments containing silver nitrate or potassium permanganate.—*Pharm. Ztg.*, 1889, 745.

Chlorinated Lime.—E. Koefoed has made experiments upon this substance to ascertain if it contain the compound $CaOCl_2$, or if be a mixture of calcium chloride and hypochlorite. His conclusions are that chlorinated lime contains both chloride and hypochlorite of calcium, and are based upon the following two observations. (1) If an aqueous solution of bleaching powder be dialyzed, the dialysate will contain approximately twice as much calcium chloride as hypochlorite.

(2) Chlorinated lime, treated with water, will yield to the solvent considerably more calcium chloride than calcium hypochlorite. These experiments would indicate a mechanical mixture of the two salts and not a definite chemical compound.

The action of *bleaching powder* upon *alcohol* was also reinvestigated, with these results: If a clear solution of the bleaching powder be warmed with alcohol there will be liberated small quantities of chlorine and oxygen, with formation of calcium carbonate and hydrate; calcium formate could not be detected among the products. The experiments lead him to results indicating that from 3 molecules calcium hypochlorite there are formed 1 molecule chloroform, 1 molecule calcium carbonate and ½ molecule calcium hydrate; writing alcohol as $CH_3—CH_2OH$, the CH_3 group is chlorinated to form CHCl, while the group CH_2OH is changed by oxidation into CO_2 and H_2O.—*Pharm. Ztg.*, 1889, 747.

Hydrofluosilicic and fluoboric acids (H_2SiF_6 and HBF_4) as well as their soluble salts, possess in a very marked degree the property of preventing fermentations. A ten per cent. glucose solution, to which four per cent. yeast had been added, did not show any signs of decomposition when kept for weeks at 30–35° C., if 0·1 to 0·5 per cent. of the calcium salts of the above acids were present. Grape juice, with 0·2 per cent. of the same salts, will keep well at 30–35°; starch paste, under the same conditions, remains also unchanged.—F. J. Homeyer, *Pharm. Ztg.*, 1889, 761.

A quantitative estimation of cellulose, which is simple and convenient, in that the crude material is taken without previous extraction with solvents, is as follows: 10 grams of the material, with 3–4 times its weight of sodium or potassium hydrate and 30–40 cc. water, are placed in a tubulated retort and heated in an oil-bath, the temperature of which is obtained by use of a thermometer, the bulb being in the same line with the bottom of the retort. When heated to about 140° C., effervescence commences, and the temperature is then slowly allowed to reach 180°; one hour's heating at this temperature is generally sufficient, the end of the reaction being noticed by the mass becoming dry. The retort removed from the oil-bath is allowed to cool to 80° C., warm

water added and the contents rinsed into a beaker; after cooling, the solution is acidified with dilute sulphuric acid, which causes the formation of a flocculent precipitate, containing the fine particles of cellulose which were suspended in the alkaline solution; by the careful addition of a dilute sodium hydrate solution an alkaline reaction is obtained, causing the precipitated substances, with the exception of the cellulose, to redissolve. The solution is filtered, by aid of a filter pump, through a very finely-perforated platinum cone, the precipitate thoroughly washed with hot and cold water, then again removed to the beaker, digested with alcohol, refiltered and washed with ether. The precipitate is dried in a water-bath, weighed, ignited and the ash subtracted from the first weight, the difference giving the pure cellulose. This determination can be made in 5–6 hours, and the results are exact.—Dr. G. Lange, *Ztschr. f. Physiol. Chem.*, 1890, 283.

Bromoform has recently been recommended by Dr. Stepp in the treatment of whooping-cough. The daily dose ranges from 5–10–15–20 drops in four fl. ozs. water (f℥i–f℥ij alcohol increases the solubility of bromoform in water) given in hourly doses of one to two teaspoonfuls. The dose is in direct proportion to the intensity of the infection and the age of the patient. Bromoform differs from chloroform (which was also used, but found to be of no value) in its internal administration by not acting upon the mucous membranes. It is prepared by adding bromine to a solution containing equal parts of potassium hydrate and methyl alcohol until a faint yellow color appears; the bromoform is freed from acid by washing with sodium carbonate solution, dehydrated over calcium chloride and rectified. It forms a colorless liquid, sp. gr. 2·8, boils at 150° C., and is only slightly soluble in water, 100 cc. water dissolving after persistent agitation only 5–6 drops.—*L. Reuter in Pharm. Ztg.*, 1890, 5.

A superior black ink, which is not affected by water or acids, is made by mixing warm solutions of potassium bichromate and gelatin, exposing to sunlight for one-half hour, adding a solution of nigrosin in water, filtering, and finally adding a few drops of creasote.—(Ind. Bl.) *Pharm. Post*, 1889, 877.

The purification of alcohol by Schmitt's method consists in taking crude alcohol containing 30 per cent. by volume, adding potassium carbonate (not enough to cause two layers to form), and agitating with petroleum ether; this solvent removes completely the fusel oil from the alcohol. After separating the light layer, potassium carbonate is added to the alcohol in sufficient quantity to form two layers, the lower one consisting of a saturated solution of potassium carbonate, the upper one of 94 per cent. alcohol containing a small quantity of potassium carbonate. The alcohol layer is syphoned off and mixed with just sufficient strong sulphuric acid to precipitate the potassium salt as sulphate which is insoluble in alcohol of 94 per cent., and which can then be removed. Alcohol purified in this manner, without distillation, it is claimed, can not be distinguished from that purified by the usual method. -(*Ztschr. f. landw. Gew.*) *Pharm. Centralhalle*, 1889, 722.

A convenient disinfectant is made by forming into pastilles paraffin 9·5; iodine, 1·0, and salicylic acid 2·0. These pastilles are burnt in the rooms to be disinfected or deodorized; the products of the combustion contain iodine and carbolic acid, upon which their value depends.—(*D. Med. Ztg.*) *Oesterr. Ztschr. f. Pharm.*, 1889, 622.

Resorcin as an Antivomicum.—J. Andeer has noticed that chemically pure resorcin, unlike the impure resorcin which always causes vomiting, is the best of the remedies for checking vomiting, especially in disorders of the stomach. Other investigators have confirmed the accuracy of the above. It has also been used successfully as an antidote for various emetics.—(*Ztschr. f. Ther.*) *Oesterr. Ztschr. f. Pharm.*, 1889, 649.

Two New Antipyretics.—Prof. Dr. Michaels has applied for patents for the preparation of *acetylethylenphenylhydrazin* and *ethylenphenylhydrazinsuccinic acid*, which will soon be introduced and claim the attention of practitioners. The former is prepared by dissolving ethylenphenylhydrazin in an excess of acetic anhydride, and boiling for a short time, after cooling acetylethylenphenylhydrazin crystallizes out, and is purified by recrystallization from alcohol; it forms colorless needles,

melting at 222° C. Ethylenphenylhydrazinsuccinic acid is made by dissolving equal parts by weight of ethylenphenyldrazin and succinicanhydride in alcohol, boiling for a short time, when a crystalline mass of the compound is formed which is purified by washing with alcohol. It is soluble in hot water, slightly soluble in alcohol, easily soluble in solution of sodium carbonate, from which the acid is reprecipitated by addition of hydrochloric acid; it melts at 303° C.—(*Südd. Apoth. Ztg.*) *Oesterr. Ztschr. f. Pharm.*, 1889, 649.

ABSTRACTS FROM THE FRENCH JOURNALS.

Translated for the American Journal of Pharmacy.

Phosphoglycerites of Lime and Soda.—At a meeting of the *Société de Pharmacie de Paris* (Nov. 6), M. Varenne proposed that these preparations be tested in therapeutics. The soda salt is very soluble in water, and the lime salt dissolves readily if a small quantity of hydrochloric acid be added. The author does not give the formula for the present, having a doubt as to whether or not he has obtained chemical combinations in his mixture.

Comparative Activity of the Digitalins.—M. G. Bardet (*Acad. des Sci.*), reports recent researches upon amorphous or crystallized digitalin—the digitoxin of German chemists—and with digitalein, which, in Germany is called digitalin. He arrived at the following conclusions: Crystallized and amorphous digitalins prepared according to the French Codex, are wholly soluble in chloroform. They have an identical activity and are uniform in their effects. The German digitoxin is incompletely soluble in chloroform, and its activity is from two to three times less than the digitalin of the codex. French digitalein and German digitalin, both of which are soluble in water and insoluble in chloroform, are not definite products. They have a like activity and therapeutic action, but the action is twenty to twenty-five times less than the digitalin of the codex or chloroformic digitalin. On the other hand, it is possible that the action upon the heart may not be exactly the same as the action of the digitalin of the codex.—*J. de Ph. et de Chim.*, Dec. 1.

Posology of Chloral.—In the *Archives de Neurologie* M.

Yvon cites the principal mixtures now in use for the administration of chloral. As a HYPNOTIC: Chloral, 2 to 5 gm.; bromide of sodium, 1 to 3 gm.; syrup of codeine and syrup of laurocerasus, āā 15 to 20 gm.; water, 100 gm. For CARDIAC DYSPNŒA (Sée): Chloral, 2 to 4 gm.; potassium iodide, 1·25 gm. to 2 gm.; mucilage, 120 gm.; a tablespoonful every hour. ENEMA FOR CONVULSIONS: Musk, 20 cgm.; camphor, 1 gm.; chloral, 50 cgm. to 1·50 gm.; yelk of egg, No. 1; water, 100 gm. FOR SUPPOSITORIES: Chloral, 1 gm.; cacao butter, 3 gm.; ext. hyoscyamus, 1 to 2 cgm.

INCOMPATIBILITY OF ANTIPYRINE WITH NAPHTHOL.—M. Chabrol (*Bull. com.* Nov.), having received a prescription for napthol β and antipyrine, āā 10 cgm., with salicylate of bismuth, 25 cgm., for 1 cachet, to make eight in all, found that his mixture turned at once to a damp paste. He mixed the ingredients in several ways, but the result was always the same. He finally obviated the difficulty by first mixing the antipyrine with five times its weight of sugar. He expresses the opinion that physicians would perhaps do well to be cautious about prescribing combinations of new drugs whose reactions are as yet imperfectly understood, but which are liable, as in this instance, to give rise to chemical compounds which may prove injurious or dangerous.

PREPARATION OF SOLUBLE TAR.—The object is to get solubility in water for vegetable tar and all of its components. Saline waters do not dissolve tar, either pure or combined with an alkali. But tar, when saponified was very soluble in distilled water after elimination of the excess of alkali. Following this indication, the following formula was devised, quite different from those thus far published. Take of Landes tar (from Pinus maritima), 1,000 gm.; dry soda, 140 gm.; water, 800 gm. The soda, in solution, is poured over the tar, stirring, and left in contact for two hours. Another mixture is made as follows: Water, 9 kil. 200 gm.; marine salt, 2 kil. 500 gm.; crys. carb. soda, 1 kil. 250 gm. The salts are dissolved in boiling water and to this is added the first solution. After 5 minutes of stirring the fire is drawn. In a few days the mother liquors separate and the tar is run off and washed with its weight of water by decantation. The liquors, if

kept to a proper strength, may be used repeatedly. The author has called this "soluble tar" because it is integrally soluble in 2 or 3 times its weight of distilled water. Greatly diluted, the preparation takes the form of a persistent emulsion resembling absinthe liquor.—*Nouveaux Remèdes*, Nov. 24.

Sulphoricinic Acid as a Solvent for Antiseptics.—Berlioz and Ruault find that sulphoricinic acid, made by treating oil of ricinus with sulphuric acid, makes an excellent dissolvent for salol, naphthol, creosote, phenic acid, etc. This acid emulsionizes perfectly with water, whether or not mixed with the substances described. Ten per cent. solutions of naphthol and phenol are easily made in this way, and these are superior to the camphorated solutions of these substances on account of the readiness with which they unite with the moisture of the damp surfaces to which they are applied.—*Nouv. Rem.*, Dec. 8.

Preparation of Oxamide and Oxamic Acid.—M. Mathieu-Plessy introduced oxalate of ammonia into fused nitrate of ammonia and maintains the mass at a heat of 338° to 347° F., for four hours. He thus obtains a compound which, taken up by water, yields 6½ per cent. of oxamide, and a quantity of oxamic acid corresponding to 54 per cent. of oxamate of baryta. —*Acad. des Sci.; J. de Phar. et de Chim.*, Nov. 15.

Iodinated Muslin.—Taking advantage of the property possessed by cellulose of fixing iodine, which is afterward set free under the influence of gentle heat, M. Méhu lately proposed a method of making "iodinated squares" to be applied in the same way as ordinary sinapisms of paper impregnated with the oil of mustard. The iodinated muslin is said to have certain advantages over applications of tincture of iodine, apart from its convenience. It acts more evenly, there is less irritation or blistering and the desired effect may be longer continued. In preparing the muslin, MM. Breaudat and Cathelineau have improved upon M. Méhu's process. They first place the fabric for a few minutes in a 2 to 100 solution of bi-carbonate of soda. They then press and wash it and let it remain for half an hour in a 4 to 100 solution of chloride of lime. Then it is again washed until no alkaline reaction is observed, when it is plunged into a 5 to 100 solution of

hydrochloric acid for a quarter of an hour, after which time the acid is washed out and the muslin carefully dried. The cloth is now fitted to retain the iodine vapors. The iodine, finely pulverized, is spread evenly upon both sides of the fabric, which is then loosely rolled and introduced into a jar. The latter is warmed until vapors begin to arise, when it is sealed and placed in a water-bath for two hours at 212° F. On cooling, the muslin is put away in glass jars for use.—*Répert. de Phar.*, Dec. 10, 1889.

CHEMICAL NOTES.

By Henry C. C. Maisch, Ph.G., Ph.D.

Valence of Aluminium.—Nilson and Petterson, in their latest publication on the vapor density of aluminium chloride (*Zeitschr. für physik. Chemie*, 1889, p. 206) report on some experiments, which support their previous investigation and from which they draw the following conclusions: From the boiling point aluminium chloride is in constant dissociation until above 800° C. the state of a perfect gas is reached when the vapor density corresponds to the formula $Al Cl_3$, which does not change at the highest temperature obtainable. This proves without any doubt that aluminium is a trivalent element.

Alkaloidal Reagents.—A. L. Brociner (*Jour. Pharm. Chim.*, 1889 (5) *20*, p. 390) draws attention to a solution of 1 gm. perrutheniate or rutheniate of potassium in 20 cc. very pure concentrated sulphuric acid (sp. gr. 1·184) as a reagent for alkaloids. *Solanine*, with a drop of this reagent, in a few minutes begins to assume a red color, after about 20 minutes the whole liquid has acquired the same color, which disappears on slight heating. *Ononin* is colored immediately brownish-red. *Chelidonine* gives a green coloration. *Imperatorin*, at first blue, soon changes to an intense green. The latter reaction is best obtained with the perrutheniate, while rutheniate gives the best results with the rest. The author furthermore calls attention to a solution of 1 gm. ammonium uranate in 20 cc. concentrated sulphuric acid. This solution must be prepared just before using. *Codeine*, on slight heat-

ing, gives a blue color. *Imperatorin*, also, gives a blue color, which soon disappears, especially on heating. *Morphine* gives, on warming, a dirty green color, which slowly disappears.

Estimation of cinchona, with petroleum. Laudrin (*Comptes rendus*, through *Pharm. Centralh.*, 1889, 725) gives the following method for the assay of cinchona bark: To 300 gms. finely powdered cinchona, 75 gms. soda and 75 gms. calcium hydrate, sufficient water is added to dissolve the former, and the whole well mixed. Two litres of petroleum are then added and the whole heated to 100° C. for 20 minutes, the liquids being well shaken. The mixture is again treated with the same quantity of petroleum and this solution of the alkaloids treated several times with water acidified with sulphuric acid. The acid liquid is then carefully neutralized with ammonia, when, on cooling, 90 per cent. of the alkaloids separate. The mother liquor is then precipitated with soda, the alkaloidal mixture converted into the sulphate and weighed.

Abnormal Occurrence of Cholesterin.—J. B. Nagelvoort (*Nieuw Tijdschr. voor Pharm., Chem. en Toxikol.*, 1889, 305) noticed, when analyzing some cod-liver oil, needle-shaped crystals mixed with small truncated crystals, in place of the usual glossy leaflets. The crystals gave the cholesterin reaction, with sulphuric acid becoming reddish-brown and changing on addition of water to a dirty green.

Composition of Oil of Betel Leaves.—Prof. J. F. Eykman's results with this volatile oil, distilled by himself from fresh leaves, which had been in part reported in 1888, have been communicated to the German Chemical Society (*Berichte*, 1889, pp. 2736–2754). The oil was pale greenish-yellow, became golden-yellow and brown on exposure, was slightly levogyre and had the spec. grav. 0·969 at 15° C. Caustic potassa removed from the oil *chavicol*, a phenol of spec. grav. 1·030 at 15° C., boiling between 236° and 238° C., and having a peculiar odor, somewhat resembling that of creasote; its composition is $C_9H_{10}O$; its aqueous solution is colored blue by ferric chloride, the color disappearing on the addition of alcohol; its constitution is expressed by the formula $C_6H_4 < \begin{matrix} OH(^1) \\ C_3H_5(^3) \end{matrix}$. The crude chavicol seems to contain

a small quantity of a phenol of somewhat higher boiling point, and in alcoholic solution becoming blue with ferric chloride. Betel oil, freed from phenol, did not yield, by fractionating, a pure compound in sufficient quantity for examination. The fraction between 173 and 176° contained several terpenes, but no pinene, and had a very agreeable lemon-like odor, while a mint-like odor was observed in the fraction between 190° and 220°. From the higher boiling fraction a hydrocarbon, sesquiterpene, was obtained, having a slight odor, boiling at 260° C., and in acetic solution acquiring a deep indigo-blue color with bromine.

The author also calls attention to the betel oil obtained by Schimmel & Co. (see AMER. JOUR. PHAR., 1889, p. 312) from dry betel leaves, and shows that the oil did not contain the above compounds to which the fresh leaves owe their characteristic odor; they may have been dissipated by drying, or oxidized by exposure, or lost by remaining dissolved in the water; the use of steam under pressure may have volatilized more of the high boiling phenol than is obtainable by ordinary distillation.

Safrol, when oxidized by potassium permanganate, yields, according to Th. Poleck (*Berichte der D. Ch. Ges.*, 1889, p. 2861) piperonal and piperonylic, carbonic, formic, acetic and oxalic acids, but no propionic acid, as was stated by Schiff in 1884.

THE SEEDS OF CALYCANTHUS GLAUCUS.[1]

By H. W. WILEY.

The weight of 100 seeds unhulled was found to be 21·1964 gm.; the average weight of each seed is therefore about 200 mgm.

The pods, hulls and kernels were examined separately. The pods and seed-hulls were ground in a drug mill and passed through a $\frac{1}{2}$ mm. mesh sieve. On account of the great quantity of oil in the kernels, they were reduced to as fine a powder as possible on an iron plate or pulverizer, and the oil removed by petroleum spirit. The deoleated residue

[1] Abstract of a paper published in *American Chemical Journal*, December, 1889, pp. 557–567.—J. M. M.

was ground to a fine flour and passed through a ½ mm. mesh sieve. The following results were obtained:

	Pods.	Seed Hulls.	Kernels.	
			Unextracted	Extracted.
Moisture,	9·03	11·39	5·36	3·52
Petroleum spirit extract,	3·07	1·22	47·08	3·64
Ether extract,	3·25	0·30	1·29	0·31
Absolute alcohol extract,	1·73	0·54	9·69	17·33
80 per cent. alcohol extract,	1·87	1·09	2·48	6·33
Fibre insoluble in dilute acid and alkali,	29·26	30·71	1·36	2·85
Ash,	4·24	1·72	1·08	4·69
Albuminoids,	5·25	2·63	23·62	42·31
Digestible fibre, starch, etc., by difference,	42·26	50·40	8·05	13·00

A considerable quantity of albuminous matter is extracted by alcohol. The almost entire absence of starch is a noteworthy characteristic of calycanthus seed, a cooled decoction giving only a faint reaction with solution of iodine. The percentage of oil is very large; Dr. Eccles reported 39 per cent., but the author found over 47 per cent. The seeds contain nearly twice as much of albuminoids as wheat. The quantity of sugar (dextrose, sucrose and dextrin) is also large, and it is easy to see why the "bubby" berries are greedily sought after by cattle.

The oil from calycanthus seed has a faint yellow color, and a peculiar odor. Compared with water at the boiling point the specific gravity is ·9058 for the extracted and purified oil, and ·9110 for the expressed oil. It is free from volatile acids. The iodine absorption for the crude expressed oil was 129·53, and for the purified extracted oil 128·66 per cent. The fatty acids crystallized at 12·5. The refractive index of the oil determined by the Pullfrick refractometer at 28° is 1,47351, the index of pure water at the same degree 1·33338.

The alkaloid in calycanthus seed was discovered by Dr. R. G. Eccles, of Brooklyn (*Western Druggist; Druggists' Circular; Proceedings Amer. Phar. Assoc.*, 1888, pp. 84 and 382). The author obtained this aklaloid from the extracted oil, by wash-

ing the latter with dilute sulphuric acid (1·50) removing from the acid liquid traces of oil by petroleum, rendering alkaline by ammonia, and extracting the alkaloid by ether; yield ·027 per cent. of the oil.

Experimenting with the kernel of the seeds freed from hulls and deprived of fat by petroleum spirit, it was ascertained that ether, alcohol, chloroform, or a mixture of ether and alcohol would extract only a portion of the alkaloid. Better results were obtained with a mixture of ether, alcohol and ammonia. The following process yields the largest amount of alkaloid in a pure state: Digest for four days 10 gm. of the powder with 100 cc. of dilute sulphuric acid (1:50) at about 35° C.; make the emulsion-like mixture strongly alkaline with ammonia, shake with ether, pour off the slowly separating ethereal layer and evaporate; wash the resulting extract with about 100 cc. of dilute sulphuric acid, free this solution from fat, etc., by washing with ether, render strongly alkaline by sodic hydrate and shake with ether. Yield 4·25 per cent.

Calycanthine separates from ether in feathery crystals, or on slower evaporation, in triangular crystals.

By treatment as indicated above, the hulls yielded ·83 per cent. of alkaloidal principle, containing traces of calycanthine and an amorphous compound the nature of which has not yet been determined.

Dr. Eccles described the beautiful green color produced by nitric acid. The following additional color reactions were observed: H_2SO_4 pale yellow. H_2SO_4 + sucrose fine purple, persistent and changing finally to blue. $H_2SO_4 + K_2Cr_2O_7$ fine blood-brick-red.

Dextrose, maltose, etc., gave also the furfurol reaction but without so marked a purple as with sucrose. The presence of sugar in the seeds renders it possible to secure the furfurol reaction in the raw seed by the simple application of H_2SO_4.

Rubidium-Ammonium bromide, according to Dr. Rottenbiller (*Internat. klin. Rundschau*), when given in doses of 5 gm. daily, reduces the frequency of epileptic attacks, but like potassium bromide exerts no permanent effect in this disease.

ON SCOPOLA CARNIOLICA (*Jacquin*).

A series of papers were read at an evening meeting of the Pharmaceutical Society, in London, December 11, 1889, and published in *Pharmaceutical Journal and Transactions*, December 14, of which we give brief abstracts in the following. The introductory paper, by Prof. W. R. Dunstan, of the Research Laboratory of the Pharmaceutical Society, makes the following explanatory statements:

"Rather more than a year ago Mr. Ransom brought under my notice a rhizome which had recently appeared in the drug market, being offered as a substitute for the root of *Atropa Belladonna* under the name of *Belladonna Scopolia*. It was imported from Germany, and was stated to grow wild in the Carpathian Mountains and in other parts of Austro-Hungary. The juice of the plant was supposed to possess mydriatic properties. From further inquiries it appeared that an abundant supply of the plant could be obtained should any demand arise for it.

Two species of *Scopola* have already been made the subject of chemical investigation, viz., *Scopola japonica* and *Scopolina Hladnikiana* (see AMER. JOUR. PHAR., 1888, pp. 235 and 236). *Scopola japonica* has been used to some extent in medicine. The new rhizome was not, however, likely to be derived from either of these plants, since the first is indigenous to Japan and does not grow in Europe, while *Scopolina Hladnikiana* is rare and practically unknown outside the botanic garden.

Chemical investigation soon showed that we have in this plant a new and important source of hyoscyamine. The chemical examination of all the constituents of this plant is not yet quite complete, although the most important have been minutely studied. We think it desirable to publish our present results without delay, since it appears from an announcement in a recent number of a German periodical that at the meeting of the Naturforscher Verein, at Heidelberg, Prof. Schmidt, of Marburg, stated that he is working at a species of *Scopola* which seems likely to be the same as that we have investigated."

A second paper "on the Chemical Constituents" of the root, by Prof. Dunstan and A. E. Chaston, gives in detail the pro-

cesses for isolating the various constituents and determining their properties.

Of the known mydriatic alkaloids *Scopola carniolica* is shown to contain only one (hyoscyamine) in any appreciable quantity; there may also be present a minute amount of hyoscine, although we we were unable to conclusively prove this to be the case. *Scopola carniolica* appears to be distinguished from other plants which yield mydriatic alkaloids in containing hyoscyamine in an almost, if not quite, pure condition. It must, however, be borne in mind that in investigating the alkaloidal constituents of this plant advantage has been taken of the facts recently established with reference to the instability of hyoscyamine when in contact with fixed alkalis, or when heated to the temperature of boiling water. The plant was dried at a low temperature, exhausted with cold alcohol, and the alcoholic percolate was evaporated at 30°–40°, while no fixed alkalis were use in extracting the alkaloid. It has not yet been definitely established that atropine is actually present in belladonna, or indeed in any plant, and it has not yet been shown that the hyoscine which is often obtained, besides atropine and hyoscyamine, is a constituent of the plant, and has not been produced during the extraction of the alkaloids.

From the fatty and resinous constituents of the rhizome, by treating the acidulated mixture with chloroform, a mass of needle-shaped crystals was obtained melting at 137·5°, and on combustion yielding results, agreeing with the formulas $C_{26}H_{44}O$ or $C_{27}H_{46}O$, each of which has been assigned to cholesterin. The amount was rather more than 0·1 per cent. It appears to most nearly resemble phytosterin (from seeds) and daucosterin (from carrots), and to have been for the first time noticed in the natural order Solanaceæ. The authors obtained it also from the root of *Atropa Belladonna*, and approximately in the same amount as from the scopola rhizome. After recrystallization of the acids, obtained by saponifying the fat, they appear to consist mainly of arachic acid $C_{20}H_{40}O_2$.

A crystalline sugar has also been obtained which reduces Fehling's solution and yields an osazone apparently identical with that obtained from dextrose. A crystalline substance

which is highly fluorescent especially in alkaline solutions, appears to be identical with Eykman's scopoletin and with the chrysatropic acid of Kunz; there are grounds for believing it to be methyl-æsculetin.

The third paper is by F. Ransom, "on the Pharmacy of Scopola." The percentage of alkaloid was determined by a slight modification of the process proposed by Prof. Dunstan and the author for the essay of belladonna (see AMER. JOUR. PHAR., 1884, p. 279). Two samples of the root yielded ·43 and ·51 per cent. of alkaloid, while from belladonna root ·35, ·38 and ·39 per cent. had been obtained. Experiments made with menstruums of different alcoholic strength showed that a mixture of 4 parts of alcohol and 1 part of water extracted more alkaloid than a weaker or stronger spirit. Based upon these results, the following preparations are proposed:

Extractum Scopolæ alcoholicum.—Alcoholic extract of scopola.

Take of Scopola rhizome, No. 20 powder, ... 1 pound
Rectified spirit, ... 48 fluid ounces
Distilled water,
Sugar of milk, of each a sufficiency.

Mix the spirit with 12 fluid ounces of distilled water, macerate the scopola in two parts of this mixture for 48 hours, agitating occasionally; then transfer to a percolator, and when the fluid ceases to pass, continue the percolation with the remainder of the diluted spirit. Afterwards subject the contents of the percolator to pressure, filter the product, mix the liquids and evaporate over a water-bath to the consistence of a soft extract. Estimate the alkaloidal strength of this extract by the following method:

Dissolve 2 grams of the extract in about 10 c. cm. of warm distilled water acidulated with a few drops of diluted hydrochloric acid. Pour the solution into a stoppered glass separator, and add ammonia until the liquid is distinctly alkaline. Agitate for a few minutes with 16 c. cm. of chloroform, separate and again wash the aqueous liquid with 3 c. cm. of chloroform. Agitate the mixed chloroform solutions with 10 c. cm. of diluted hydrochloric acid, separate, wash with 3 c. cm. of the diluted acid, mix the acid solutions, render alkaline with ammonia, and agitate with 10 c. cm. of chloro-

form. After separation wash the alkaline solution with 3 c. cm. of chloroform, mix the chloroform solutions, evaporate in a dish of known weight and dry the residue, which should be nearly colorless, at a temperature of 200° F. (93° C.). The weight of the residue thus obtained multiplied by 50 will give the percentage of alkaloid present in the extract. Having thus ascertained the strength, warm the extract over a water-bath in a dish of known weight and adjust by evaporation or by the addition of distilled water and sugar of milk in such proportion that the finished extract shall be of firm consistence and shall contain 2 per cent. of alkaloid.

Extractum Scopolæ liquidum.—Liquid extract of Scopola. It is proposed to be prepared with alcohol of the same strength, as is used for the extract. 100 cc. are to contain 0·25 gm. of alkaloid.

Emplastrum Scopolæ. — Plaster of Scopolæ. Alcoholic extract of scopola, 4 oz.; Resin plaster and Soap plaster of each, 8 oz. It contains nearly 0·4 per cent. of alkaloid.

Linimentum Scopolæ.—Liniment of Scopola. Liquid extract of scopola, 24 fluid ounces; Camphor, 1 oz.; Rectified spirit and Water, in the proportion of 4 to 1, sufficient to make 30 fluid ounces. Contains $\frac{1}{5}$ gr. alkaloid in 100 fluid grains.

Tinctura Scopolæ.—Tincture of Scopola. Liquid extract of Scopola, 4 fl. oz.; Proof spirit, 21 fl. oz. Contains $\frac{1}{25}$ gr. of alkaloid in 100 fluid grains.

Unguentum Scopolæ. — Ointment of Scopola. Alcoholic extract of scopola, 1 oz.; Benzoinated lard, 9 oz. Contains $\frac{1}{5}$ per cent. of alkaloid.

The fourth paper, entitled "Observations on the Therapeutic Action of Scopola carniolica," by Sir Dyce Duckworth, M.D., relates the action of the drug in seven cases, and concludes as follows:

So far as these few observations go, I think it justifiable to affirm that in scopola we have a drug which proves itself equally effectual with belladonna, and if it can be supplied at a cheaper rate than the latter drug, it can hardly fail to prove a boon to a large class of sufferers who can ill-afford to pay for efficient local employment of belladonna. I could have wished to adduce many more facts before this meeting, but

I am still investigating the properties of scopola, and may perhaps have the honor of adding to this communication at some future time. I am anxious to know if the extract proves as effectual for arrest of activity in the lacteal glands as does belladonna, also to try its properties in some varieties of heart disease.

The fifth paper, "The Natural History of Scopola carniolica (*Jacquin*)," gives a complete history of the synonymy of this plant, commencing with Matthioli, who in 1563 named it *Solanum somniferum alterum.* It was further described in 1622 by Caspar Bauhin under the name of *Solanum somniferum bacciferum;* in 1651 by J. Bauhin as *Solanum manicum* "quod secundo loco proponuimus;" in 1761 by J. A. Scopoli, Professor of Botany, at Pavia, as *Atropa caule herbaceo foliis ovatis, integris, fructu capsulari;* in 1764 by Jacquin as *Scopola carniolica;* in 1767 by Linnæus as *Hyoscyamus Scopolia;* in 1794 by Moench as *Scopola trichotoma;* in the same year by Schultes as *Scopolina atropoides;* in 1821 by Link as *Scopolia atropoides*, and in 1837 by G. Don as *Scopolia carniolica.*

The generic name Scopolia had been applied in 1763 by Adanson for what is now *Ricotia, Lin., Cruciferæ;* in 1776 by Forster for what is now *Griselinia, Forst., Cornaceæ;* in 1781 by Linnæus fil., for what is now *Daphne, Lin., Thymelaceæ;* in 1790 by Smith for what is now *Toddalia, Juss., Rutaceæ.*

Jacquin's name for the plant being the first binomial one published after the date of the first edition of Linnæus' *Species Plantarum* in 1753, should supersede the later names given by others. This author repeatedly writes "Scopola" (*not* Scopolia) in his published work.

The geographical distribution of *Scopola carniolica* appears to be limited to S. W. Germany (Bavaria), Austro-Hungary (Styria, Carinthia, Carniola, Croatia, Banat, Transylvania) and S. W. Russia (Podolia and Volhynia). It grows in damp, stony places among bushes in beechwoods on calcareous soil, chiefly in hilly or mountainous districts. In appearance it closely resembles belladonna in shape of leaf, shape, color and position of flower, in the branching of the stem and in the floral leaves being frequently geminate. But it differs in its short stature (about 1 foot high) in the more reticulated

thinner leaves, the capsular, transversely dehiscing fruit and in the presence of a rhizome.

Two varieties of the plant were described by Koch (Syn. II, p. 585), the common form having tubular bell-shaped flowers of a brownish-purple color, and the other growing at

SCOPOLA CARNIOLICA (*Jacquin*).—(From Jacq. Obs. Bot. I, tab. 20.)

a higher elevation, having an obovate-campanulate corolla of a green color. The latter was described by Koch under the name of *Scopolina Hladnikiana*,[1] suggested to him by Freyer, who also issued the plant as *Scopolina viridiflora* in Raben-

[1] In Prof. E. Schmidt's paper, published in *Archiv der Phar.*, 1888, p. 214, the specific name is given as *Hlardnackiana*.—Editor AM. JOUR. PHAR.

horst's *Flor. Eur. Exsicc.*, No. 2056. A third variety, with yellow conical-campanulate flowers, is mentioned by Decandolle under the varietal name *β concolor*.

The genus forms a link between the genera *Hyoscyamus* and *Atropa*. In the tissue of the rhizome it more nearly approaches the latter genus in having the peculiar sandy raphides present in both root and leaves of belladonna, but not in henbane.

Bentham and Hooker refer two other plants to the genus "Scopolia," viz: *Scopola japonica* and *S. lurida*. The former was described by Maximowicz; but in a recent letter he states that he has strong doubts about its being a good species, and that it is hardly different from the European plant.

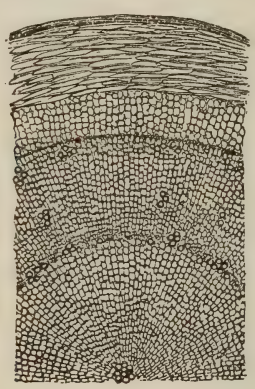
S. lurida, Dun., is a Himalayan species, which has also been referred to under the names, respectively, of *Anisodus luridus*, Link and Otto; *Nicandra anomala*, Link and Otto; *Physalis stramonifolia*, Wallich; *Whitleya stramonifolia*, Sweet; *Anisodus stramonifolius*, G. Don. The large fusiform root seems worthy of chemical investigation since, according to the late Dr. E. J. Waring, it is as powerful as belladonna, if not more so. Mr. Holmes finds in the fresh root the peculiar raphides common to the other two species, but more abundant in the cortical portion. The leaves, flowers and calyx of the plant recall the characters of *Physalis* rather than of *Scopola*.

The sixth paper, by Thomas Greenish, compares "the histological characters of the rhizome of *Scopola carniolica* with those of the *Atropa Belladonna*."

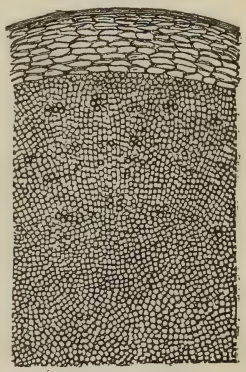
Immediately under the epidermis of the belladonna root there is a layer of cortical cells forming a dark line. On isolating the individual cells it is found that this cortical layer consists of from six to eight tabular cells deeply colored. Next below on the drawing but inward in the root, are several layers of thin cells, pressed or stretched in a tangential direction, long and narrow; and further down again several layers of cells not so long and wide, being subjected to less pressure they tend more toward the shape of the cell in its normal condition. These together constitute the bark.

Within the bark there is a faint, thin line, the cambium layer, externally surrounding the vascular bundles, which are themselves imbedded in the cellular or fundamental tissue, and in somewhat definite lines. The cells of the bark within that dark line are of a faintly-brown color, and the same remark applies to the cells composing the fundamental tissue, but there is an entire absence of schlerenchymatous cells.

All the parenchymatous cells of the bark and from the bark inward are more or less filled with starch grains, but these were removed to make the structure more visible. Most of them *in situ* are compound grains, being composed of two or more adhering together. The typical form is the muller-



SECTION OF BELLADONNA ROOT.



SECTION OF SCOPOLA RHIZOME.

shaped grain. When the combination is a doublet they adhere by their truncated bases, and when a triplet they are muller-shaped with dihedral bases. A dark spot will be seen here and there in the fundamental tissue. These are cells of raphides cut in a transverse direction. Examining these raphides by a micro-chemical process, the application of acetic acid slowly permeating the tissues under the slide, there was no effervescence, and it was concluded that the raphides are not composed of a carbonate; most probably they are oxalates. Longitudinal sections of each were made, but they exhibited nothing special beyond the cells above referred to, in their length showing a long cell or sac filled with raphides.

Passing now to a description of the *Scopola carniolica*, the dark line under the epidermis is narrower and less colored than that of belladonna. The entire bark is not so thick; also, the vascular bundles are neither so large nor so numerous, and the bundles of raphides are less bold than in the belladonna root. In fact, much the same tissues are present, but less pronounced than in belladonna. The starch grains also are smaller, the typical grains being, as in belladonna, muller-shaped, but there is a large number which it is difficult to assign to any well-defined type of starch grains.

Very minute details, when they do not serve to elucidate any point in this investigation, have been avoided. On the whole it will be evident from this histological interpretation that there seems a close alliance in anatomical structure between the rhizome of *Scopola carniolica* and the root of *Atropa Belladonna*.

ADDITIONAL NOTES ON SCOPOLA.

By John M. Maisch.

As a supplement to the highly valuable information contained in the foregoing paper, the following historical and pharmacognostical notes will be found of interest.

Wittstein, in *Handwörterbuch der Pharmakognosie*, 1882, p. 787, writes that "Matthiolus discovered this plant in the sixteenth century near Görz, and also figured it, but it seems to have been forgotten, until Scopoli (†1788) found it again near Idria. . . . Wier's experiments with the plant as a remedial agent received little attention. In more recent times Dr. Lippich, of Padua, again used the undoubtedly very active plant in such diseases which have thus far been usually treated with belladonna."

Schroff (*Pharmacognosie*, edit. 1869, p. 299) states that "the plant which grows near Idria, Laibach, in Hungary, etc., has recently been again more frequently employed, particularly the leaves, herba scopolinæ, and the root, radix scopolinæ. . . . The rootstock is almost horizontal, 0·026–0·04 m. thick, of a whitish color, in some places thickened, almost jointed, has few annulations, produces upon a protuberance occasion-

ally several buds, and has few long rootlets." However, the drug appears to have attracted little attention at that time, even in Austria and Hungary; for it is not mentioned in Prof. Schroff's *Pharmacologie* (1863), nor in the official report by the same author on the medicinal substances exhibited in 1873, at the international exposition at Vienna.

According to Schleiden (*Pharmacognosie*, 1857, p. 501), the leaves of this plant are employed in Southern Europe in precisely the same manner as belladonna leaves. It is probable that these references are based upon the observations of Dr. Lippich mentioned above.

A brief notice of the latter was published in Buchner's *Reportorium* (1844) lxxxiv, p. 386, in connection with a note on an essay by Dr. Köstl.[1] "*Scopolina atropoides* merits all praise as an excellent remedy in salivation, ulcers of the mouth following the use of mercury, offensive breath from ulcerations, scrofulous ulcers of the nose, syphilitic ulcers, bone ache, aphthæ, etc. Prof. Lippich has published in detail his observations with the remedy in the medical annals (*Jahrbücher*) of Austria, vol. xx. . . . It is used like belladonna; the root seems to merit the preference. . . . Most interesting information is contained in vol. ii, p. 771–775 of "Die neuesten Entdeckungen in Materia Medica," by Prof. Dr. Dierbach.

Previous to that time the plant was also mentioned in certain works. Thus, Martius (*Pharmakognosie*, 1832, p. 174) stated that the leaves have been mistaken for belladonna; and Kosteletzky (*Med. Phar. Flora*, 1832, p. 944) described the plant and added that "it possesses the same narcotic properties as hyoscyamus, and has also been employed by several physicians in various nervous complaints, but on account of its limited occurrence has never been in general use."

The plant and its uses are not alluded to in the universal pharmacopœias by Jourdan and by Geiger and Mohr, which were published about the same time as the two works last mentioned. But in some later works the statement is found

[1] Observationes et experientiæ, quas citra remedia eorumque formulas in Instituto medico-clinico Patavino a Prof. Lippich directo, septem annorum (1834–1841) cursu præscribi solita conscripsit, et medicorum usui adcommodavit Dr F. Köstl. Viennæ, 1843, apud Braunmüller et Seidel.

of the leaves being mistaken for belladonna, for instance in Berg's and in Wiggers' *Pharmacognosie*, in Henkel's "Die Merkmale der Aechtheit," etc., in Wolff and Hirsch's "Prüfung der Arzneimittel," in the "National Dispensatory," etc. According to Moeller's *Pharmakognosie* the leaves resemble—more than those of *Solanum nigrum*—the leaves of belladonna, but they are smooth and are free from cells containing crystalline sand.

Regarding the distribution of the plant in the southern part of Central Europe, Kosteletzky states that it grows in shady woods in Bavaria, Carniola, Hungary and Croatia; but according to Garcke (*Flora von Deutschland*) it is indigenous to Carniola, and within the boundaries of Germany it has merely run wild in grassy places, for instance in Silesia.

MINUTES OF THE PHARMACEUTICAL MEETING.

PHILADELPHIA, January 21, 1890.

The meeting was called to order by asking Mr. A. Robbins to preside.

The minutes of the last meeting were read, there being no corrections called for they were ordered to stand approved.

A copy of the Proceedings of the American Pharmaceutical Association was presented to the library by Professor Maisch, the permanent Secretary.

The Year-Book of Pharmacy of the British Pharmaceutical Conference, which answers in many respects to the report on the progress of pharmacy of the American Pharmaceutical Association was also presented to the library by the Conference.

The third edition of the Pharmacopœa Nederlandica, published in 1889, was exhibited. This has just been received from Europe.

A paper upon *beef, wine and iron* was read by E. G. Eberhardt, a member of the present senior class, which exhibited the character of some of this preparation as found in the market.

A paper upon *Eupatorium purpureum* was read by Professor Trimble. Professor Maisch inquired if any experiments had been made to ascertain its color reactions. Professor Trimble said that an alcoholic solution of ferric chloride merely darkened the solution somewhat, giving scarcely any reaction. He thought that Mr. Ray failed to obtain the crystalline principle, because of the small quantity of material he worked with. Professor Maisch stated that since the crystalline principle had been received from Professsor Lloyd in 1876, it had been sent to him by three or four other parties; samples which he had tested had given a dark green color with ferric chloride, similar to that produced by quercitrin; Professor Trimble had now shown that after purification the principle does not give this reaction.

Professor Maisch showed some frames from the first volume of a work, entitled *American Woods*, and published by R. B. Hough, Lowville, N. Y.;

each frame contains three sections—transverse, radial and tangential—made through the sap and heart-wood of an American tree, either native or introduced, and cut sufficiently thin to allow, in a measure, the transmission of light, so that they may be used as slides for the oxyhydrogen lantern, or inspected by the aid of the microscope. The trees having been identified by the author in the field, before felling, for preparing the sections, the authenticity of the specimens renders the work of especial interest to the professional botanist as well as to intelligent persons generally. Similar sections of woods have been used for business and fancy cards, and found application for a variety of uses in the arts.

Mr. G. M. Beringer exhibited a sample of the true *patchouli leaves*, not often seen by the druggists. They are of frequent and almost continual use by perfumers. Some years ago Mr. E. M. Holmes, Curator of the Museum of the British Pharmaceutical Society, showed that the commercial leaves are sometimes adulterated, and that substitutions have been met with, which may be distinguished by the shape of the leaves and by their anatomical characteristics.

Mr. Beringer also exhibited some *cassie flowers*, the flowers of *Acacia Farnesiana*, said to be grown in the neighborhood of Charleston, S. C. As usually met with in the market, cassie flowers, though indigenous to tropical America, are obtained from Northern Africa and France, where the tree is cultivated. Mr. Beringer said that he had seen it stated that the plant was also indigenous to Texas, Mexico and to Australia.

Professor Maisch stated that he had imported some new botanical models of flowers and fruits which he would be glad to exhibit to the members at his cabinet room; it was suggested that a committee be appointed to bring them down in time for the next meeting, and return them to their place after their exhibition.

On motion, there being no further business, the meeting adjourned.

T. S. WIEGAND, *Registrar.*

REVIEWS AND BIBLIOGRAPHICAL NOTICES.

Proceedings of the American Pharmaceutical Association at the Thirty-seventh Annual Meeting, held at San Francisco, Cal., June, 1889. Also the Constitution, By-laws and Roll of Members. Philadelphia: Published by the American Pharmaceutical Association. 8vo. Pp. xxiv and 850.

Year-book of Pharmacy, comprising Abstracts of Papers relating to Pharmacy, Materia Medica and Chemistry, contributed to British and foreign journals from July 1, 1888, to June 30, 1889; with the Transactions of the British Pharmaceutical Conference at the Twenty-sixth Annual Meeting, held at Newcastle-on-Tyne, September, 1889. London: J. & A. Churchill. 8vo. Pp. 559.

With the beginning of the new year these two annuals have made their appearance. The American publication contains the "Minutes" upon 312 pages, which includes the thirty-seven papers read at San Francisco, a goodly number having been contributed by members from the Pacific Coast. The following 433 pages are occupied by the "Report on the Progress of Pharmacy," which corresponds to the "Year-book" of the British publication. The "Transactions" include the text of the thirty-two papers read at Newcastle. Accounts

of the two meetings, including a synopsis of the various papers, were published in the August and September numbers of our preceding volume. The "Unofficial Formulary Addenda" contains formulas for nine preparations, which we intend to republish in our next issue.

A Manual of Organic Materia Medica, being a guide to materia medica of the vegetable and animal kingdoms, for the use of students, druggists, pharmacists and physicians. By John M. Maisch, Ph. M., Phar. D., etc. Fourth edition, with 259 illustrations. Philadelphia: Lea Brothers & Co. 12mo. Pp. 539.

The publication of four editions of this work within eight years indicates that there was a need for such a work, which has been filled by the one bearing the above title. The preface of the present edition states that "it is in the nature of descriptive works that a certain monotony, inseparable from the material treated of, renders the text uninviting to casual readers not interested in the subjects, or ignorant of the intrinsic importance of the various details." It is then shown that for practical application a description of the *essential* physical, histological and chemical characters of organic drugs is needful as a guide in studying the different drugs and determining the variations caused by diverse agencies; also how such studies may lead to further original research. The literature on the subject has been carefully collected and condensed; but though also a few drugs have been added, the principal change was made in the list of drugs arranged according to origin, in which Beatham and Hooker's *Genera plantarum* has been followed, which seemed to be particularly appropriate in view of the approaching revision of the United States Pharmacopœia.

The following *Proceedings of State Pharmaceutical Associations* have been received:

Arkansas.—Seventh Annual Meeting. Pp. 64. See our last volume, p. 377.

New Hampshire.—Sixteenth Annual Meeting. Pp. 46. Next meeting at The Weirs, September 9th. Geo. F. Underhill, Concord, is President, and Chas. B Spofford, Claremont, Secretary.

North Dakota.—Fourth Annual Meeting. Pp. 32. See last volume, p. 538.

South Dakota.—Fourth Annual Meeting. Pp. 57. See last vol., p. 539.

Wisconsin.—Tenth Annual Meeting. Pp. 64, and Report of the State Board of Pharmacy, Pp. 40, —. See last volume, p. 539.

OBITUARY.

Professor Philipp Weselsky died in his native town Saar, Moravia, November 14, 1889, in the sixty-second year of his age. He served an apprenticeship in pharmacy, then studied in Vienna, and in 1854 became the assistant of Professor Schroetter in the chemical laboratory of the Vienna Polytechnic Institute, who in 1869 was succeeded by H. H. Hlasiwetz. After the sudden death of the latter in 1875, Weselsky became his successor until, in 1883, failing health induced him to resign the position in an institute where he had labored successfully for twenty-nine years. His original investigations led to the discovery of coloring matters, derivatives of phloroglucin and resorcin, and

embraced also the nitro-compounds of phenol, eugenol, pyrogallol, hydroquinone, pyrocatechin and other compounds.

Paul Balluff, a prominent pharmacist of New York City, died there of pneumonia, January 8th, at the age of 64 years. He was born in Riedlingen, Würtemberg, and, with his elder brother, served his apprenticeship in the pharmacy of his father, and subsequently as assistant in several pharmacies in Germany and Switzerland. After attending the university at Tübingen he passed the State's examination for Würtemberg in 1850, but in 1852 came to this country, locating at first in Williamsburg, N. Y., and afterward in New York City. He was a very active member, and for some years the presiding officer, of the German Apothecaries Society of New York and of the New York College of Pharmacy; he was also at one time a vice-president of the American Pharmaceutical Association. Two daughters survive him.

Emlen Painter, Ph.G., President of the American Pharmaceutical Association, for the current year, died at Spuyten Duyvel, N. Y., January 15th, of consumption, in his 46th year. He was born at Concord, Delaware County, Pa., educated there in the Friends' school, and became an apprentice to Chas. Shivers, in Philadelphia, where he graduated from the College of Pharmacy, in 1866. In the following year he went to San Francisco, where he was in business for about sixteen years, during which time he did good service in assisting in the establishment of the California College of Pharmacy, and as Professor of Pharmacy in this institution. He returned East in 1883, locating in New York City, where he conducted the Brunswick Pharmacy until a short time before his death. There he identified himself with the New York College of Pharmacy and served as one of its Trustees with his accustomed faithfulness and energy. In the American Pharmaceutical Association he was on several occasions nominated by the California pharmacists as their representative; and in the meetings he soon became conspicuous through his earnestness. The selection of San Francisco as the place for, and the success of last year's meeting is largely due to his energy and perseverance. His remains were interred in Woodland Cemetery, in Philadelphia. The deceased leaves a widow and five children.

Charles H. Cressler, Ph.G., died in Chambersburg, Pa., of pneumonia, January 29th, aged 51 years. He learned the drug business in his native town, with Wm. Heyser, graduated from the Philadelphia College of Pharmacy, in 1861, and afterward was in business in Chambersburg until the time of his death. He was to some extent instrumental in bringing to the prominent notice of physicians two drugs of American origin, both of which were admitted into the last pharmacopœia. His thesis on the "ergot of Indian corn"—now officinal as Ustilago—was published in this journal 1861, p. 306; and he pointed out (*ibid.*, 1878, p. 290) the efficacy of the rhizome of Aspidium marginale, now recognized, with that of male fern, under the official title Aspidium. The deceased was one of the original members of the Pennsylvania Pharmaceutical Association, and rendered faithful service for a series of years, on committees and as president. He also took a prominent part in all measures for the advancement of his native town and county, and for many years was a very efficient member of the school board.

THE AMERICAN
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MARCH, 1890.

BACTERIAL POISONING THROUGH MEDICINES.

By H. P. Campbell, Ph. G.

Many cases of poisoning have been traced to tainted meat, spoiled ice cream, and various other articles of food in which putrefactive decomposition had commenced, but there appear to be none directly traced to medicines. When we stop to think of the universal distribution of micro-organisms, and of the many drugs and solutions of drugs furnishing them with favorable conditions for growth, we can see that in all probability many such cases must have occurred. Bacteriology is such a comparatively new study that many of its details have not as yet been learned, and while the physician might look for disease germs in the system of the patient, he would not be apt to extend that care to the medicine. If the drug did not produce the usual effect, he would be far more apt to attribute it to an idiosyncracy on the patient's part, or to the disease having taken an unusual course, rather than to foreign bodies in the medicine. It was a long time before it was understood how commonly contagious diseases were spread by the bacteria finding their way into the water supply, and in future, doubtless, many things will be found dangerous in this respect which now pass unsuspected. That these organisms may find lodgments even in mixtures that are usually considered antiseptic in their action was very forcibly called to my attention by the following case, which caused some trouble and anxiety to all parties concerned.

The mixture ordered was quinine and whiskey, and was kept by the purchaser nearly a month before having occasion to use it. When the medicine was finally taken it made the patient very sick,

and the symptoms so much resembled those caused by an irritant poison, that the physician who had been called in pronounced it a case of poisoning. The patient was finally brought around all right, but the druggist was charged with having made a mistake, and dispensed some poison in place of the quinine. He however, was positive that the mixture had been dispensed as ordered and that he was not responsible for the patient's sickness. To determine if possible the cause of the trouble the remainder of the mixture was forwarded to me, with the request to give it a thorough examination.

The fluid presented the usual appearance of whiskey and on diluting with water showed the characteristic fluoresence of quinine. After evaporating the alcohol the solution gave a deep green color (thalleioquin) with chlorine water and ammonia. This was sufficient to prove the presence of quinine, and to show at least that nothing had been substituted for it. However, in the bottom of the bottle there appeared a dark, slimy-looking sediment, which failed to dissolve on shaking. This showed that something must be wrong as of course quinine should be freely soluble in a menstruum containing so large a percentage of alcohol as whiskey does.

On removing some of this sediment and examining under the microscope, it was found to consist almost entirely of micro-organisms, with a few particles of woody matter which had served as nuclei for the formation of many of the colonies. Like crystals, these growths prefer small points to start from, not liking to begin operation on a smooth surface. Wherever a piece of woody matter appeared in the liquid, it furnished the foundation for a large community of these bacteria, much larger than those without the nuclei. The other colonies being formed later, did not have time to attain as large a size as the first ones. As they were all dead when received, it was impossible to estimate their number by the usual method of cultivating on plates in gelatin, so the following method was used. The liquid was shaken up first, then one minim placed on the slide of the microscope, and the groups counted on a fraction of the field. This gave one hundred groups, and only allowing the small number of one hundred individuals to each colony, it would make 10,000 in every minim, or 150,000 to each cubic centimeter. Of course this is only approximate, and the method is not recommended for strictly accurate work, but the result was purposely placed at the lowest rather than the highest possible figure. Even at this rate a table-

spoonful dose would contain about 2,500,000 of these micro-organisms. It certainly is not a delightful thought for believers in "Rock and Rye" that their next dose may bring with it an invading army equal to that of any first-class European power, and perhaps as destructive.

The bodies present in this case would be classed as Micrococci, being small, rounded cells, requiring a magnification of about 600 diameters to render them distinct. They were collected in quite large, irregular groups, having grown by division in different directions, and not in one line, as those do that form chains. They very much resembled the section of an irregular piece of honey-comb, except that the cells are more variable in outline. The liquid appeared almost entirely free from other classes of organisms, or at least the microscope showed very few differing from these morphologically. Unfortunately, as has already been stated, it was impossible to attempt any culture experiments. Still the physiological effect on the patient was so decided that corroborative evidence was scarcely needed on that point.

A fresh mixture compounded of the same drugs as those used before, but dispensed in another bottle, produced no such effects. This disposes of the objection that an idiosyncracy of the patient in regard to quinine caused the trouble; and since chemical analysis of the liquid failed to show any foreign bodies except bacteria, to them we must refer the cause of the sickness.

How it was that the liquid became so filled with these growths is difficult to say. If it had been an aqueous solution of almost any other alkaloid it would not have been at all unusual to have found a flourishing colony of micro-organisms in it; but that an alcoholic solution of quinine should have developed them is certainly surprising. That quinine has a retarding action on fermentation[1] has been proved by Liebig, but Calvert[2] claims that the action is limited to certain classes of germs, and states that this effect is not produced on all. The commonly received theory of the therapeutic action of quinine is that it is fatal to the miasma germ, which flourishes in low swampy places where the disease is so prevalent. While the truth of this may still be questionable, it is certainly a fact that aqueous solutions of quinine and cincho-

[1] *Liebig Ann. Chem. Pharm.*, cliii, p. 152.
[2] *Proc. Roy. Soc.*, xx, p. 197.

nine are remarkably stable, and I cannot now recollect having seen one become infected, although always, even in warm weather, keeping a large quantity on hand ready for dispensing. Of course, it is necessary to use some sulphuric or other acid in dissolving it, which might have some effect in checking these growths. Yet the quantity necessary to use is so small, that the alkaloids themselves must have at least a retarding effect.

The antiseptic action of alcohol is too well known to be even questioned, and the sp. gr. in the case (making allowance for the dissolved quinine) showed that it was up to the U. S. P. requirements of over 44 per cent. alcohol. This very nearly corresponds to the official diluted alcohol, which has always been considered amply sufficient to protect solutions from bacteria. This is shown by the fact that 36 of the 79 fluid extracts in the Pharmacopœia are made from dilute or even weaker alcohol, also 36 out of 73 tinctures are likewise made from dilute alcohol. The reason why the organisms grew under conditions fatal to most germs is undoubtedly their greater vitality, at least in reference to alcohol. When antiseptics were first introduced there was little idea of the vast difference between classes of germs, and it was taken for granted that a substance fatal to one was fatal to all. It was soon found that antiseptics were not always effectual, and on this account much discredit was undeservedly thrown on the whole theory. As the subject was more thoroughly studied, it was found that one class would thrive under conditions fatal to another class, and that disinfectants immediately fatal to some germs had no effect whatever on others.

Thus alcohol is inhibitory to nearly all of these growths; but that some can flourish in it is already well known, any vinegar factory furnishing an instance. In making vinegar the sugar is first converted into alcohol, and then the latter is further oxidized by the influence of bacteria (Mycroderma aceti) into acetic acid. Now, if these germs could not survive in an alcoholic liquid, it is evident that this latter reaction could not occur, and the alcohol would remain unchanged. Further light on this subject is furnished by Dr. Le Bon,[1] in a paper read before the French Academy in 1883. He states that, while alcohol is a strong preventive, yet after these

[1] *Drug. Circ.*, xxvii, p. 140.

germs have once begun to grow, it acts feebly both in checking their growth and causing their death. Thus if the bottle had contained some colonies before the medicine was put in they might have increased until finally overcome by the alcohol.

If this was the way the trouble originated, it furnishes a good example of probably the most prolific source of infection that druggists have to deal with, viz: dirty bottles. When a prescription has been partly used by the patient, the sides of the bottle usually present the very conditions under which bacteria thrive best. The glass is covered with a layer of damp organic matter, and if placed on the mantel, which seems to be the most convenient place for many people, is kept warm by the heat of the stove, thus adding the only thing needed to make it a veritable paradise for these organisms. Thus tenanted, the bottle is returned to have the prescription renewed, supplying them with fresh food for their growth. Some stores have already adopted a custom which disposes of this danger, and is worthy of more general adoption, that of giving a new bottle every time the prescription is renewed. While causing some extra work, it is certainly preferable to simply rinsing the bottle out, as enough spores are nearly always left to seed a new crop. The same is true of attempting to remedy stock solutions that have become infected, by simply filtering and washing out the bottles. The ordinary filter is absolutely useless, as the spores or seeds are so minute that they will pass through the interstices, and start a new growth in the solution. The primary fault in making these solutions is that the water used contains a few germs to start with, and if the substance dissolved is not antagonistic to their life they very rapidly increase. This is likewise true of distilled water as ordinarily collected, and it has been suggested that a better method would be to boil the water for half an hour and then keep it protected from the air. This appears at once the simplest and yet the most effectual method of getting rid of these growths. Few bacteria are now known capable of living under such treatment, and the water, if immediately placed in full bottles, keeps very well. Water thus prepared is especially useful for hypodermic solutions. It is well known that the inflammation so frequently set up in this form of medication is due to the bacteria introduced at the same time. This is usually counteracted by adding some antiseptic to the solution, but the wisdom of this is questionable, to say the least. Most

European countries now forbid the use of such chemicals as salicylic acid and borax for the preservation of food, and any method which will do away with their use is certainly a step in the right direction.

Not to unnecessarily prolong this article, the following list comprises most of the substances in a pharmacist's stock that are liable to infection. In some, of course, the danger is small, but they are added for the sake of completeness. Water used in making solutions, including distilled; all aromatic waters, aqueous mixtures and chemical solutions (not antiseptic), including dilute acids; decoctions, infusions, vinegars, mucilages and plant juices; syrups and confections; lard, oils and emulsions; elixirs and wines; fluid extracts and tinctures made from dilute or weaker alcohol; solid extracts, all damp drugs, and drugs from the animal kingdom like pepsin, ox-gall, etc.

NEW YORK DISPENSARY,
February, 1890.

NOTE ON PURE ATROPINE SULPHATE.

BY J. B. NAGELVOORT.

There is no necessity to repeat what science owes to Schmidt, Ladenburg and Will on atropine, hyoscyamine and hyoscine. Their labors are known and appreciated.

I desire only to record an observation about the situation of to-day. Presuming that the distinction made in the price currents of chemical manufacturers in speaking of *heavy* sulphate of atropine (the condensation product of hyoscyamine), or in mentioning a contradictory melting point (115° C.), or in quoting *atropinum purum* and *atropinum naturale*, will not be understood by many. The pharmacist would be saved a good deal of annoyance if the revised U. S. Pharmacopœia, in its description of the properties of atropine sulphate and pure atropine, would not repeat the accuracy of the edition of 1882, that these compounds must answer satisfactorily to properties, distinctly different from those of hyoscyamine. Eminent ophthalmological authorities have observed that the effect of both alkaloids on the healthy and on the diseased eye is equal. The samples of atropine sulphate, on which my observations are based, were derived from two different manufacturers of

high standing. Both samples melted at 188° C. I had taken the precaution of subjecting each one to Vitali's test. They were lævogyre. (Atropine is optically inactive.) Their gold double salt had a melting point of 150° C., and was in brilliant, golden colored scales, procured in the usual analytical way. They did not have the form of the salt reproduced by Wormley (Microchemistry of Poisons, Plate xiii, Fig 2); but I may state that broken glass has macroscopically about the same appearance as the gold double salts of the two samples of atropine sulphate had under a magnifying power of 100 diameters.

This experience is in accord with the observations of others, and leads to the conclusion that the atropine sulphate used in our drug stores at the present time is in reality hyoscyamine sulphate.

COLORIMETRIC METHOD FOR ESTIMATING TANNIN IN BARKS, ETC.

By Samuel J. Hinsdale, Fayetteville, N. C.

Read at the Pharmaceutical Meeting, February 18.

Dissolve 0.04 gram potassic ferricyanide in 500 cc. water, and add to it 1·5 cc. (about 22 drops) liquor ferri chloridi. Call this *Iron Mixture.*

Dissolve 0·04 gram "pure" tannin (gallotannic acid), which has been dried at 212° F., in 500 cc. of water. Call this *Tannin Solution.*

Exhaust 0·8 gram oak bark with boiling water, and make it up to 500 cc. with cold water.

Place six 2 ounce clear glass tumblers (or Beaker glasses) on a white surface, and in one of them, *with a dropping pipette* (about four inches long and one-quarter inch wide) *about half filled*, put *five drops* of the infusion of bark, and in the others, *with the same pipette* (after rinsing), put 4, 5, 6, 7 and 8 drops of the "tannin solution." (The drops of the infusion and of the tannin solution must be uniform. The use of the same pipette, about half filled, *insures that.*)

Now, add to each 5 cc. of "iron mixture," and in about one minute add to each tumbler about 20 cc. water, and *within three minutes* observe the shades of color. The number of drops of "tannin solution" used in the tumbler which corresponds in shade of color

to the tumbler containing the infusion of bark, *indicates the percentage of tannin in the bark*, i. e., if it is the one in which seven drops were placed, the tannin strength of the bark is *seven per cent.*

It is best to observe the shades of color horizontally, rather than vertically, and to hold up the infusion tumbler, with the one which most nearly corresponds, opposite to a white wall, with your back to the light.

The above is written for *oak bark*, but the same process will answer for any substance containing less than ten per cent. of tannin. The results are necessarily in terms for commercial gallotannic acid, and not in those of pure tannin or of the particular tannin in the material assayed.

For substances containing between about 10 and 20 per cent., it is best to dilute the infusion with an equal part of water and proceed as above, using *five drops* of the *dilute* infusion, and for the answer, *double the result*. Thus, if the *diluted* infusion of tea required eight drops "tannin solution" to correspond, call the percentage *sixteen*.

For substances containing less than one or one and a-half per cent., exhaust *8 grams* instead of *0.8 gram*, and take *one-tenth* of the result for the answer. For substances containing more than twenty per cent., as galls, sumach, catechu, etc., you may dilute the infusion with two, three or more times its bulk with water, and calculate as above (as with tea), or you may use 1, 2, 3 or 4 drops of the undiluted infusion in the first glass and make the calculation thus, i. e.: As the number of drops of infusion used is to the number of drops "tannin solution" used (to correspond), so is 5 to the answer—thus, suppose *two* drops infusion were used and the corresponding tumbler contained *fifteen* drops tannin solution—2 : 15 : : 5, answer 37.5 per cent.

The object in diluting the infusions is because the infusion glass may be of too deep a blue shade. It is better that it should just produce a *light blue*.

The tumblers must be perfectly clear and clean.

The "iron mixture," "tannin solution" and infusion must be freshly prepared and not exposed to the rays of the sun.

The water used must be free of iron and tannin.

SOME PLANT CONSTITUENTS.

ABSTRACTS FROM THESES.

Contribution from the Chemical Laboratory of the Philadelphia College of Pharmacy—No. 68.

Wm. J. Enders has analyzed the fruit of *Apium graveolens* and found that petroleum ether extracted 18·67 per cent., of which 16·48 per cent. dissolved in absolute alcohol, 1·72 per cent. remained undissolved and 0·54 per cent. volatilized at 110° C. and represented the volatile oil. The portion soluble in absolute alcohol was a dark reddish brown oily liquid of a penetrating odor and a strong taste, though not resembling the odor or taste of the drug. This according to some writers consists largely of oil.

Stronger ether extracted from the residual drug 1·73 per cent. of a dark brown resinous substance with a strong aromatic odor.

A crystalline glucoside was separated from the remainder of the drug by exhausting with absolute alcohol, recovering the alcohol, dissolving the residue in water and agitating with chloroform. This substance gave the reactions of a glucoside and gave off a strong odor when boiled with dilute acid. It was not further examined, since the amount from 50 grams of the drug was small.

Harry Vin Arny examined *Parthenium Hysterophorus* which is found in waste places in the West Indies, Northern Patagonia and Southern United States, especially in Florida and Louisiana. It is characterized by its extreme bitterness due, as shown by the investigator, to a glucoside which was extracted from the drug by alcohol, the alcohol recovered and the residue dissolved in water. This aqueous solution yielded the glucoside to chloroform by agitation with that liquid, from which it separated as a brown amorphous mass.

The author concludes that this glucoside is so-called *parthenine* (see Proc. Am. Pharm. Association for 1885 and 1886) which was originally supposed to be an alkaloid. The drug is much esteemed in the West Indies where it is used in place of quinine.

Harry C. Haak found a crystalline principle in the petroleum ether extract of *Azalea viscosa*. The residual extract after recovering the petroleum ether was dissolved in absolute alcohol boiling hot, and this solvent deposited crystals on cooling. The crystals were purified by re-solution in absolute alcohol and treatment with animal charcoal.

Edward S. Smythe obtained the odorous principle of *Gnaphalium polycephalum* (life everlasting) by distilling the drug with water. This substance of semi-solid consistence was diffused through the aqueous distillate from which it was removed by agitation with ether. It was of a light green color and possessed the peculiar odor of the drug to a considerable degree. The drug was found to contain 7·9 per cent. of moisture and 5·7 per cent. of ash. Extraction with the usual solvents failed to yield any unusual plant constituents.

Charles B. McKeel extracted a quantity of the fixed oil from *sunflower fruit.* This oil when pure is almost free from odor and is said to be used for culinary purposes.

The oil was found to exist in the fruit to the extent of 27·06 per cent., and was obtained by extraction with petroleum ether. On the large scale a gallon of oil is obtained from a bushel of the seeds.

As ordinarily extracted the oil has a light yellow color and a slight nut-like odor and taste. It is soluble in ether and chloroform, but insoluble in alcohol, and is easily saponified but is non-drying in exposure to air.

PHARMACOGNOSTICAL NOTES.

Abstracts from Theses.

Croton Oil.—Wm. C. Zinnel, Ph.G., determined the amount of oil present in commercial croton seeds. The seeds were beaten to a paste, exhausted by successive portions of the solvent, and the latter then evaporated or distilled. Using for each experiment 100 gm. of seed, the amount of oil obtained was as follows: with benzin, 33·321 gm.; with chloroform, 22·9 gm., and with carbon disulphide, 33·7 gm. The two last oils were darker in color and more viscous than the first; that obtained by benzin was pale straw-yellow and had the spec. grav. ·943. The cause of the small yield with chloroform was not ascertained. The seeds (100 gm.), deprived of the testa, which constituted 29·67 per cent. of the entire weight, gave with benzin 21·8 gm. of oil; no cause is assigned for the deficiency as compared with previous experiments. The testa yielded 1·65 per cent. of oil.

Burdock Fruit.—Thos. Donaldson, Ph.G., found the fruit to contain 7·25 per cent. of moisture and to yield 6·66 per cent. of ash.

Petroleumbenzin extracted 8·6 per cent. of yellow fixed oil, and about 1 per cent. of whitish waxy matter, the latter being insoluble in ether. The alcohol extract amounted to 15·9 per cent., partly soluble in water; the aqueous solution, when concentrated, yielded to chloroform the bitter principle in an amorphous condition. The figures obtained differ somewhat from those reported in a paper published in AMER. JOUR. PHAR., 1885, p. 127.

Amount of Alkaloid in Tea.—John Hamilton Small, Ph.G., whose thesis is accompanied by specimens of the leaves and of a flowering branch of the tea plant, grown in Greenville, S. C., has gathered some information regarding tea culture in the United States, which is believed will play, in the future, an important part in the agricultural interests of this country. The greatest obstacle seems to be the cost of labor to properly pick the leaves and to prepare them for the market. The tea plant will endure a much lower temperature than is generally supposed; but the sudden changes of our climate prevent it from being grown north of Maryland, while farther south it thrives quite well.

Eight commercial samples of tea were examined with the following results, the alkaloid being estimated by the process of Paul and Cownley (see AMER. JOUR. PHAR., 1887, p. 628):

Commercial Name.	Color.	Theine.
Japan, uncolored,	greenish black,	1.79 per cent.
Japan, colored,	bluish green,	2·30 "
India, fine white top,	black,	3·54 "
Foochow,	black,	3·40 "
Young Hyson,	bluish green,	3·26 "
Congo,	black,	3·52 "
Chinese imperial,	bluish green,	2·85 "
Formosa,	black,	2·38 "

Japanese Aconite.—Eugene George Reig, Ph.G., prepared from this drug a tincture and a fluid extract, following the formulas of the U. S. Pharmacopœia for the corresponding aconite preparations. Both were lighter in color than the officinal ones. On evaporating 10 gm. of each the tincture yielded 200 mgm., and the fluid extract 620 mgm. of extract. The alkaloids were determined by evaporation, taking up with water, removing coloring matter by ether, rendering alkaline by sodium carbonate, and extracting the alkaloids by ether. 50 gm. of the tincture, representing 20 gm. of root, yielded 67 mgm. of alkaloids. 40 ccm. of the fluid extract (40 gm. of the

root) gave 145 mgm. of alkaloids. The Japanese aconite used, therefore, contained 0·35 per cent. of alkaloids.

White Snakeroot.—A drug known as white snakeroot is to some extent used in a proprietary medicine in a Western city. Chas. H. Blouch, Ph.G., ascertained from a Southern dealer in crude drugs, that it is the rhizome with rootlets of *Eupatorium aromaticum.* On distilling 5½ lbs. of the drug with water, about 25 grains of volatile oil were obtained having a strong odor and a pungent taste. The drug exhausted by cold water, yielded with boiling water a solution which was precipitated by alcohol, and this precipitate behaved like inulin in being colored yellow by solution of iodine, and when boiled with diluted acid, in being converted into a sugar reducing Fehling's solution. A tincture was prepared with diluted alcohol, and a fluid extract with a mixture of two parts of alcohol and one part of water; on standing a few days both preparations deposited sediments which, however, have not been examined.

Podophyllum.—Clifford G. Dunn, Ph.G., states that the most active constituents of the resin are contained in the first portion of the alcoholic percolate, while the later percolates yield a resin which differs very much from the former in activity. Podophyllotoxin may be prepared by macerating one ounce of the resin in 4 fluid ounces of chloroform free from alcohol, filtering, and adding the filtrate to 16 parts of benzin. It forms a light yellowish white powder, the chloroformic solution of which should remain clear on the addition of ether, but deposit white flocks when mixed with petroleum spirit.

ON COLLENCHYMATIC CORK.[1]

By Hans Molisch.

Directly beneath the external epidermis of the fruit of numerous varieties of *capsicum* is found a tissue of several tiers which, from its appearance, must be, and thus far has been, regarded as collenchymatic parenchyma. T. F. Hanausek (*Nahrungs- und Genussmittel*, p. 312) describes it as follows: "Beneath the epidermis is a parenchyma, the cells of which are tangentially much elongated in the first and second rows, appear rectangular in the third and fourth

[1] Translated from *Berichte der Deutschen Botanischen Gesellschaft*, 1889, p. 364.—J. M. M.

(last) rows, viewed from above are polygonal, measure about 0.035 mm., and are thickened in such a manner that the tissue must be designated as collenchyma layer." This tissue is also described as collenchyme by J. Moeller (*Mikroskopie der Nahrungsmittel*, p. 245) who, however, states that its membranes do not give the reaction for cellulose.

Having for some time studied the histochemistry of capsicum fruit, the behavior of this tissue attracted particular attention inasmuch as, notwithstanding the collenchymatic character of the cells, all reagents for cellulose gave negative results.

The histology of the pericarp of capsicum may be briefly sketched as follows: A transverse section of a large fruit shows first an epidermis composed of thick-walled cells, followed by the collenchymatic parenchyma mentioned above, in about four to seven tiers, the thickened cell walls of which do not give the cellulose reaction; then follows a large-celled thin-walled parenchyma having a somewhat collenchymatic appearance and acquiring a fine violet color with iodine zinc chloride (Chlorzinkjod). The succeeding layer is made up of very large, somewhat viaduct-like cells which are completely collapsed in the dried pericarp, and are covered by the inner derma; the latter being composed of thin-walled non-lignified and of isolated thick-walled lignified cells. Conforming to the great variability of the genus, the structure is subject to considerable variations, more particularly in regard to the quantitative development of the several layers; for instance, the collenchymatic tissue may be reduced to a single cell-layer, and in the small-fruited Cayenne pepper is even entirely wanting.

The cell-walls of the "collenchyme" appear under the microscope colorless or yellowish, and by iodine zinc chloride become dark yellow or deep brown, the entire layer thus becoming sharply distinct from the cellulose-parenchyma beneath. After prolonged action of the reagent the innermost very thin layer of the cell wall is colored violet, while the remaining thickening layers retain the brown color. The cell walls at the border of the thick-walled and thin-walled cells have a thicker cellulose film, and in their middle layers enclose small granules (suberin) which give to the cell wall a granular appearance. Treatment with iodine and sulphuric acid does, likewise, not result in blue coloration.

These cell-walls are also entirely destitute of lignification, since

they do not give the color reactions with Wiesner's reagents, with metadiamido-benzol, or with thymol-hydrochloric acid.

Concentrated potassa solution colors the cell-walls deeper yellow, particularly after warming; if under the cover glass the heating be continued to boiling, numerous yellow granules and globular masses issue from the cell walls in the manner which is characteristic for cork-tissues, according to the researches of von Hoehnel (1877); at the same time the stratification of the cell-walls becomes about parallel with the surface of the pericarp. The addition of water causes the granules to disappear and the stratification to become indistinct. The cell-walls of the tissue in question, on being treated with Schulze's mixture, show the peculiar cerinic acid reaction, and on treatment with concentrated chromic acid, have the precise behavior of suberized membranes.

From these reactions it becomes evident that this tissue is cork collenchymatically developed. Such a tissue combining the most important characteristics of collenchyme and cork, has thus far been unknown. I call it *collenchymatic cork;* but it might also be properly named *suberized collenchyme.* Its appearance, the manner of thickening and the contents, correspond with parenchymatic collenchyme. For the cells, until their period of death, contain living plasma, nucleus, oil and red coloring matter becoming blue with concentrated sulphuric acid. But they differ from typical collenchyme in not directly giving the cellulose reaction. They further resemble collenchyme in not having the radial arrangement characteristic for cork cells.

It will be seen that this peculiar tissue of the capsicum fruit unites the characters of the two typical tissues, cork and collenchyme, intermediate forms of which were heretofore unknown; and it evidently serves also the designs of both in adding to the firmness of the pericarp and in aiding the functions of the epidermis.

The berries of other solanaceæ, like *Atropa Belladonna, Solanum nigrum* and *Solanum Lycopersicum* do not contain collenchymatic cork. This, however, was found in *Solanum melongena* var. *coccinea*, where it is two to four cell-tiers thick, has a golden-yellow color, is decidedly collenchymatic and, like the epidermal cells, suberized in a high degree. The yellow coloring matter of the cell membrane, on being treated with concentrated sulphuric acid, acquires a deep orange red color.

CHEMICAL NOTES.

By Henry C. C. Maisch, Ph.G., Ph.D.

Oil of Rosemary.—R. A. Cripps (*Pharm. Jour. and Trans. Nov. 23, 1889* p. 405) examined four samples of this oil, and found two adulterated with petroleum and two with alcohol. The adulteration in the first two oils was found by heating on a waterbath until the odor had completely disappeared. The solubility of the oils in alcohol of 0·838 sp. gr. was 1 in 20 resp. 30 parts, pure oil dissolving in 5 pts. of alcohol. The solutions were of a yellow color, one showing fluorescence. The oils adulterated with alcohol were colored by magenta and were soluble in 4½ resp. 3½ pts. alcohol of the above specific gravity.

Seeds of Euphorbia Lathyris.—R. Tawara reported to the Chemical Society of Tokio (*Chem. Zeit.*, 1889, p. 1706) on a chemical investigation of the Chinese drug sokusuischi (seeds of E. Lathyris). The author found besides the oil, noticed by O. Zander, two crystalline principles, one of which proved to be identical with æsculetin. The second body was not further examined on account of scarcity of material, it being present in the seeds to the amount of 0·024 per cent. Æsculin does not seem to be present.

Two new Sugars from Quebracho —C. Tanret (*Comp. rend.*, 1889, cix, p. 908) mixed coarsely powdered quebracho bark (Aspidosperma Quebracho) with milk of lime and extracted the same with 50° alcohol. The liquid is evaporated to ½ liter for every kilo of the bark used, neutralized with acetic acid and treated with basic acetate of lead. The sugar is precipitated from the filtrate with ammoniacal lead acetate, well washed and decomposed with dilute sulphuric acid. This solution is evaporated to a syrupy consistency, dissolved in alcohol of 90 per cent. to saturation, precipitated with ether and further purified. The sugar, quebrachit, has the composition $C_7H_{14}O_6$, sp. gr. 1·54 at 0° C., melts at 186°–187° C., boils in vacuo at 210° C. subliming in needles, is lævogyre $\alpha\,[_D] = -80°$, does not reduce Fehling's test, reduces ammoniacal silver nitrate on boiling and does not undergo fermentation with yeast. Quebrachit heated with hydriodic acid yields a lævogyre inosit $C_6H_{12}O_6$, an aromatic compound, melting at 238° C., boiling in vacuo at 250°; rotation $\alpha\,[_D] = -55°$.

Frangulin.—Prof. T. E. Thorpe and H. H. Robinson (*Chem. Society*, Dec. 19, 1889) use the following method for preparing the

glucoside frangulin. The bark of Rhamnus Frangula is treated with low boiling petroleum ether to remove fat, and then with alcohol, which dissolves the glucoside, resin, etc. This extract is treated with lead acetate to precipitate tannin, and the liquid is freed of lead by means of sulphuretted hydrogen. Fourteen pounds of bark yielded 5½ gm. frangulin. Composition of the glucoside dried to constant weight at 120° C. is $C_{22}H_{22}O_9$. The sugar obtainedfrom frangulin is not glucose. The other decomposition product, insoluble and of a yellow color, dried at 120° C., has the composition $C_{15}H_{10}O_5$, and is identical with emodin from rhubarb.

A delicate test for copper.—Dr. H. Thoms (*Pharm. Centralh.*, 1890, p. 32) noticed that potassium iodide was dissolved in a sample of distilled water with a yellow color. Investigating the cause thereof, he found it due to traces of copper which could not be detected by potassium ferro-cyanide. This peculiar behavior is due to the following: As copper does not form a cupric iodide when a cupric salt and potassium iodide are mixed, the copper is reduced to the cuprous state and iodine is liberated. The latter could still be detected by means of starch solutions when a solution of cupric sulphate 1 to 500,000 was treated as above.

Percentage of iodine in Fucus vesiculosus and Chondrus crispus. L. Van Itallie (*Arch. d. Pharm.*, 1889, 1132) obtained reactions for iodine by means of Prof. F. A. Flückiger's method (*Archiv*, 1887, 519) with 10 gm. ch. crispus and 3 gm. fuc. vesiculosus. For quantitative estimation, the latter alga was treated as follows: 50 gm. of the powdered plant were macerated for eight days with 40 per cent. alcohol, strained and washed with alcohol until colorless. The liquid was neutralized with sodium carbonate, evaporated to syrupy consistency, absolute alcohol added and the precipitate washed with alcohol. The filtrate was evaporated, residue dissolved in water, treated in a separating funnel with dilute sulphuric acid containing nitrous acid, and the iodine taken up with chloroform. The solution was washed a number of times with water to remove the nitrous acid and the iodine titrated with $\frac{1}{100}$ sodium thiosulphate solution. The author found 0·01078 per cent. iodine.

Chloral for Dandruff.—The *Clinical Reporter* states that a solution of 5 grains of chloral in an ounce of water will clear the hair of dandruff and prevent its falling out from that cause.

GLEANINGS FROM THE GERMAN JOURNALS.

By Frank X. Moerk, Ph.G.

Aristol or diodo-dithymol $C_{20}H_{24}O_2I_2$ is made by the action of a solution of iodine in potassium iodide upon a solution of thymol in sodium hydrate. It forms a brown-red amorphous powder containing 45·80 per cent. iodine, and is insoluble in water and glycerin, but easily soluble in ether and fixed oils; the solutions must be made without heating, as heat and also light bring about decomposition. It is inodorous and is especially valuable in the treatment of psoriasis and lupus.—Dr. F. Goldmann, *Apoth. Ztg.*, 1890, 45.

Chloral hydrate and *Antipyrine* triturated together liquefy; from the liquid, after some time, separate white crystals, which, examined by L. Reuter, were found to be an additional product of the two molecules or trichloraldehyd-phenyldimethylpyrazolon. The compound was found to be therapeutically inactive.—*Apoth. Ztg.*, 1890, 45.

Naphthalin-camphor packages in place of naphthalin paper are recommended by L. Keutmann to be made by melting together four parts naphthalin and one part camphor and pouring into pasteboard or metal boxes. They are used by fastening them to the upper part of a wardrobe or trunk, and the evaporation of the mixture can be regulated by opening the lid of the box. The camphor very nicely conceals the odor of the naphthalin. In the same way a disinfectant may be made and used, but substituting carbolic acid for the camphor; in this case it is best to impart a red color by the addition of a little alkali.—*Pharm. Centralhalle*, 1890, 17.

A delicate test for copper is based upon the liberation of iodine when potassium iodide is added to a solution of a cupric salt; in very dilute solutions the addition of starch paste is made to reveal the presence of the free iodine. The test is applicable to solutions not containing other substances which liberate iodine or which prevent its liberation; it is especially adapted to water analysis. Compared with other copper tests one part crystallized copper sulphate in 500,000 parts of water can be detected after the addition of a little starch paste; potassium ferrocyanide added to solutions (1 : 100,000) hardly shows any change, with solutions (1 : 10,000) a distinct red coloration is produced; ammonia is not applicable to solutions more dilute than 1 : 10,000, and in this dilution only a very faint blue coloration results.—Dr. H. Thoms, *Pharm. Centralhalle* 1890, 31.

Compressed drugs.—A Dresden firm has recently introduced a line of these drugs in which small quantities of the drugs sufficient to make a cupful of the infusion are wrapped up separately in tin-foil and these are put up in larger packages.—*Pharm. Centralhalle*, 1890, 32.

Chemically pure sulphate of quinine may be distinguished from the commercial sulphate and the sulphates of cinchonine, cinchonidine and quinidine by a solubility test in a mixture of chloroform and petroleum ether. 0·2 gram are briskly agitated with a mixture of 30 parts by volume of petroleum ether (sp. gr. 0·680) and 70 parts chloroform, filtering and adding 3 to 4 volumes of petroleum ether; in the absence of the other sulphates the solution will remain clear. An admixture of only 0·1 per cent. other sulphate will give rise to a precipitate or turbidity.—E. Hirschsohn, *Pharm. Ztschr. f. Russl.*, 1890, 1.

Exalgin may be distinguished by the following simple test from acetanilid and phenacetin: 1 gram is dissolved in 2 cc. chloroform (acetanilid requires 6 cc. and phenacetin 20 cc. chloroform) and 20 cc. petroleum ether (sp. gr. 0 650) added; the solution should remain clear. 10 per cent. phenacetin and 20 per cent acetanilid can be detected by the formation of a precipitate after standing a short time.—E. Hirschsohn, *Pharm. Ztschr. f. Russl.*, 1890, 17.

A test for hydrogen dioxide.—The solution to be tested is made alkaline and then a soluble neutral salt of lead or copper added; a deep brown red precipitate, rapidly changing to red and finally to white, indicates hydrogen peroxide; in concentrated solutions effervescence is also to be observed. Ozone solution (Lender's) does not give this test.—A. O. Gawalowski, *Rundschau*, 1890, 79.

Sulphurous acid as a product of the alcoholic fermentation was discovered in beer, and quite recently by Dr. B. Haas in wines. It is not a constant product but is formed by the reduction of sulphates, present in the wort or must if the fermentation proceeds very slowly; if the fermentation is a quick one, no sulphurous acid is produced. The SO_2 can be estimated by distilling the liquors in a current of CO_2, collecting the distillate in a solution of iodine and precipitating the sulphate formed with barium chloride.—*Ztschr. f. Nahrungsm. Unters.*, 1889, 241.

Eulyptol is a mixture containing salicylic acid 6 parts, carbolic acid 1 part and eucalyptus oil 1 part. The name should not

be mistaken for *eucalyptol*, the important constituent of oil of eucalyptus.—*Pharm. Ztg.*, 1890, 21.

An iodine ointment can be made by agitating powdered iodine with melted yellow vaseline; about 3 per cent. iodine will be dissolved and retained in solution upon cooling.—*D. Med. Ztg.*; *Pharm. Ztg.*, 1890, 22.

Hydrastis canadensis.—The ash of this drug has been found to contain aluminium oxide in quantity equal to 0·3 per cent. of the dry drug; the total ash amounts to 4·80 per cent.—Dr. R. Gaze, *Apoth. Ztg.*, 1890, 9.

Reduced iron may be volumetrically examined by the following method: One gram is placed in a 200 cc. cylinder or flask, dissolved in 40–50 cc. dilute sulphuric acid (1 : 5) and potassium permanganate solution added carefully until a permanent red color is produced; by the addition of a dilute sugar solution the excess of permanganate is decomposed and the solution diluted with water to 200 cc. Of this solution 50 cc. (= 0·25 gm. of reduced iron) are placed in a flask, a solution of two grains of potassium iodide in water and a few cc. of hydrochloric acid added and the flask corked; after standing for one hour the liberated iodine is titrated with $\frac{n}{10}$ solution of sodium thiosulphate adding a little starch solution towards the end of the titration. The number of cc. thiosulphate required, multiplied by 0·0056 will give the amount of total iron (metallic iron and magnetic oxide of iron). The percentage of metallic iron may be obtained directly by multiplying the cc. of thiosulphate solution used by 8·12 and subtracting 262·5.—Dr. A. Partheil, *Apoth. Ztg.*, 1890, 55.

Lard adulteration with cotton-seed oil.—Prof. Dr. A. von Asboth in *Chemiker Ztg.*, 1890, 93, confirms the results of Muter and De Koningh's method of examining the above adulteration. This method is based upon the isolation of the fluid fatty acids and determining the iodine absorption of these acids. Three grams of the sample are saponified with alcoholic KOH and the neutralized solution (with acetic acid) is poured into a boiling mixture of 30 cc. 10 per cent. lead acetate solution and 200 cc. water, stirring constantly; the lead soap is thoroughly washed by decantation, and afterwards treated with 120 cc. of ether After standing 12 hours the mixture is filtered, the precipitate thoroughly washed with about 120 cc. of ether, sufficient dilute HCl (1 : 4) added to make 250 cc.

and the mixture well agitated, until the lead salt is decomposed, when the aqueous liquid is removed, the ethereal solution washed until free from acidity and then diluted to 200 cc. by addition of pure ether; 50 cc. of this solution are freed from ether, 50 cc. alcohol added and titrated with $\frac{n}{10}$ NaOH; 1 cc. NaOH = 0·282 gram oleic acid. To determine the iodine absorption a quantity of the ethereal solution equal to 0·5 gm. oleic acid is evaporated at 50° C. in a current of CO_2, and 50 cc. Hübl's reagent are added; after standing for 12 hours in the dark, 35 cc. of a 10 per cent. potassium iodide solution are added, the mixture diluted to 250 cc. with water, 15 cc. chloroform added and then titrated with $\frac{n}{10}$ sodium thiosulphate. At the same time 50 cc. Hübl's reagent must be titrated with the thiosulphate; the difference between the two titrations gives the iodine absorbed by the fluid fatty acid taken and by calculating to 100 grams of the fluid acid the iodine absorption is found.

Pure lard yields 54 per cent. of liquid acid, with an iodine absorption of 94. Pure cotton-seed oil gives approximately 70 per cent. of liquid acid with an iodine absorption of 136. The method of calculation is as follows, A representing the iodine absorption of the sample, and B the percentage of oleic acid found:

$$\frac{A - 94}{42} \times \frac{B}{70} = \text{percentage of adulteration.}$$

ABSTRACTS FROM THE FRENCH JOURNALS.

Translated for The American Journal of Pharmacy.

Soluble Saccharate of Iron.—Athenstædt's process is given as follows in the *Moniteur Scientifique*, Nov., 1889: A 1 to 100 solution of a ferric salt is precipitated by an equally strong solution of ammonia or a fixed alkali, taking care to operate at a tempera- of about 10° C., and, in all cases, below 15° C. The precipitate must be washed rapidly in the dark and with distilled water having a temperature between 10° and 15° C. The ferric hydrate is then mixed with powdered sugar in a quantity so regulated that the dry preparation will contain 3 parts of metallic iron to 100 parts of sugar. The mixture of hydrated iron and sugar is maintained at the boiling point until the iron becomes dissolved in the syrup. The dry product is obtained by drying *in vacuo* at a low temperature. This saccharate of iron may be kept in a solution

made by diluting the mixture, when cold, with water. These solutions are clear, and remain so indefinitely.

Salicylate of Eserine.—The sulphate of eserine being deliquescent and difficult to weigh, M. Petit proposes (*J. de Ph. et de Ch.*, Dec.) to substitute for it the salicylate of eserine, which crystallizes well, is neutral and is easy to weigh; it remains unchanged for an indefinite period.

Cocaine and Iron Mixture.—The formula of Dr. Luton's mixture is given as follows in the *Rev. de Clin. et de Thérap.:* Water, sweetened with saccharin, 125 gm.; liq. perchloride of iron, 2 gm.; hydrochlorate of cocaine, 25 cgm.; dose for adults, a tablespoonful every two hours. For infants, the amount of cocaine is reduced to 10 cgm., the dose being one dessertspoonful. With this, ice should be given internally. Dr. Luton says that the use of this mixture makes the tearing away of false membrane, cauterization, etc., unnecessary. He adds that he has not for a long time had in his practice a case of death from angina. He had previously claimed for cocaine the power of aborting variola and varioloid—if used in the beginning of the attacks.—*Répert. de Phar.*, Jan. 10.

Preparations of Salol.—At a meeting of the Paris Society of Pharmacy, Dec. 4, some preparations of salol were presented under the names of *salol-santal*, *salol-copaiba*, and *salol sweet almond oil.* The author of the communication stated that salol dissolved quite freely, not only in the above-named liquids, but also in oil of turpentine, the fixed oils and liquid paraffin.

Plastic Pencils with Soap.—A note by M. Garesnier (*Soc. de Phar. de Paris*, Dec. 4), describes the preparation of the *copper crayons* made after a formula given by Prof. Tarnier, as follows: Sulphate of copper, 1 gm.; white Marseilles soap, 30 gm. The copper salt was first pulverized in a warm mortar; then the soap (rasped) was added, together with 30 drops of glycerin and 10 drops of oil of ricinus. The mass was then heated in a water-bath until it became semi-fluid, when it was drawn by aspiration into glass tubes and allowed to cool, being first slightly compressed by means of a wire and a ball of cotton. After cooling the pencils were pushed out and wrapped in paper.

Crayons of creasote were made in the same manner after the following formula: Creasote, 1 part; soap, 4 parts. The author says

that crayons of iodide of potassium, phenic acid, etc., may be made in the same way.

Sulphuric Acid Ointment.—M. P. Vigier learned that an ointment peddled by a charlatan was giving surprisingly good results in sciatica, swollen articulations of rheumatic origin, etc. Procuring some of the preparation, he analyzed it and found it to contain: Sulphuric acid, 1 part; lard, 7 parts. Vigier made up some of it for distribution. The reports were very favorable. It caused considerable redness but no blistering. The pain seems to have been relieved in all cases.[1]

Administration of Exalgin.—The formula used by Dr. Dujardin-Beaumetz is given in various journals, as follows: Exalgin, 2·50 gm.; tr. orange, 5 gm.; water, 120 gm.; syrup of orange-peel, 30 gm. A tablespoonful (containing 25 cgm. of exalgin) may be given morning and night. Desnos is said to have given 1·50 gm. of exalgin without causing disturbance. According to Dr. Dujardin-Beaumetz, this substance "is very active against the element of pain, whatever may be its origin, and is especially useful in essential or sympathetic neuralgia, tabetic pains and angina pectoris."

Administration of Caffeine.—Tanret's formula is used by Dr. Misrachi in puerperal hemorrhage; it is thus given in the *Nouv. Arch. d'Obstet.*: Benzoate of sodium, 3 gm.; caffeine, 2·50 gm., distilled water, 6 gm., or q. s. to make 10 ccm. The solution is to be made with warm water; each ccm. contains 25 cgm. of caffeine. Sixty to eighty cgm. of caffeine injected hypodermically is said to arrest post-partum hemorrhage with great rapidity.

Estimation of Uric Acid.—Arthaud and Butte, in a communication to the French Biological Society, propose the following method, founded apon the property possessed by uric acid of forming an insoluble urate with copper. Their reagent is formulated as follows: Sulphate of copper, 1·484 gm.; hyposulphite of sodium, 20 gm.; tartrate of potassium and sodium, 40 gm.; distilled water, q. s. to make one litre of solution. Contact with the hyposulphite reduces the copper salt, and the excess of the former contributes to maintain the copper salt unchanged, and to give stability to the

[1] Jourdan's *Pharmacopée Universelle* (1828), I, p. 50, contains seven formulas for sulphuric acid ointment, which was used externally in chronic ophthalmia, psoriasis and paralysis, and internally in dropsy and jaundice.—Editor Am. Jour. Phar.

mixture. Experiment, say the authors, shows that 1·484 gm. of sulphate of copper is required to precipitate 1 gm. of uric acid, hence, 1 ccm. of the authors' mixture corresponds to 1 mgm. of uric acid. In using, the phosphates are precipitated from the urine by carbonate of sodium in excess. Of the filtered liquor 20 ccm. is taken, and into this the reagent is introduced, drop by drop, until precipitation and flocculence ceases. The authors say that this reagent is very sensitive.—*Répert. de Phar.*, Jan. 10.

THE DETERMINATION OF THE DIASTASIC POWER OF EXTRACT OF MALT.

By R. A. Cripps, F.I.C.

The above title indicates the scope of this brief note; it is not my intention to enter into the question of the value of extract of malt as a nutrient, but simply to record a fact of considerable importance in connection with the determination of its value as a digestive of starchy foods.

Considerable importance is attached to the estimation of this digestive power; it is therefore very strange that published results should show such extraordinary differences, *e. g.*, Messrs. Dunstan and Dimmock (who were, I believe, the first to introduce a ready method for making this determination) state that the best malt extracts of the market should completely digest *one-seventeenth* of their weight of starch in several (three?) hours (*Pharm. Journ.* [3], ix, p. 733). Carl Jungk, in a paper in the American Journal of Pharmacy, June, 1883, and *Pharm. Journ.*, xiv, p. 104, describes a method whereby the effect of malt extract upon starch mucilage is tested at intervals of one minute, and says that good extract of malt should convert *its own weight* of starch within ten minutes at 100° F. Later still, *Pharm. Journ.*, xv, p. 236, T. S. Dymond compares the two methods above referred to, and after condemning Jungk's method, states that a good malt extract should completely digest one-fifteenth of its weight of starch in half an hour at 140° F.

I think the key to these divergencies will be found in the experiments recorded below. It is evidently not in the fact that malt extract has improved during late years, for Mr. Dymond's experiments are of later date than those of Jungk. Nor do I think that the English-made extracts of malt are inferior to those of foreign

manufacture, as might be suggested by the low results of the English experimenters; on the contrary, from the experience of large numbers of determinations, I am strongly of opinion that (generally speaking) English extracts are distinctly superior to either American or German ones.

In the first place I will describe the method I am in the habit of using, for which I do not claim any originality, it being simply a modification of the foregoing processes:

(1) Prepare a mucilage by mixing 1 grm. of potato starch or arrow-root (dried in an oven at 212° F.) with 10 cc. of cold water, add 100 cc. of boiling water, and boil the whole for half an hour; allow to cool to about 100° F., and make up the measure to 100 cc.

(2) Dissolve 5 grms. of the sample of extract of malt in water sufficient to produce 50 cc. of solution.

(3) Dissolve ·1 grm. iodine in 100 cc. of water by the aid of ·2 grm. of iodide of potassium.

50 cc. of starch solution is introduced into a flask or bottle and kept in a water-bath at a temperature of 98° to 100° F. until it has attained that temperature, when 5 cc. of the malt solution is added (also at 98°–100° F.) gently shaken to mix thoroughly, and replaced in the water-bath; after five minutes and at intervals of five minutes (or less if found desirable) 4 cc. of the liquid is poured into a test-tube containing 1 cc. of the iodine solution. A good extract of malt will give no indication of starch or dextrin after ten, or at most, fifteen minutes, while one which still gives a distinct coloration after thirty minutes should be rejected as quite unfit for use;

	0·5 grm.				0·1 grm.			0·05 grm.			
	5 min.	15 min.	30 min.	45 min.	5 min.	15 min.	30 min.	5 min.	10 min.	15 min.	30 min.
Arrowroot,	Done	—	—	—	Done	—	—	Bht brn	Pale brown	Done*	—
Maize, . .	Bluish	Bluish	Done	—	Indigo	Indigo blue	Violet	—	—	—	Clear blue‡
Potato, . .	Done	—	—	—	Done	—	—	Bht brn	Pale brown	Done†	—
Rice, . . .	Bluish	Pale bl.	Done	—	Blue	Bluish	Pale vlt brown	—	—	—	Clear violet
Wheat, . .	Brownish Violet	Violet brown	Violet tint	Very pale violet	Brown-violet	Violet	Purple	—	—	—	Clear violet‡

* Completed in twelve minutes.

† Completed in twelve and a half minutes.

‡ These colors refer to the liquid five times diluted; the color was too deep to be seen before dilution.

that is, *extract of malt should completely digest its own weight of potato starch in 10–15 minutes at 98°–100° F.*

It will be remarked that I have selected potato starch or arrow-root for this test, other starches giving widely differing results. The accompanying table will indicate the importance of using one or other of these kinds of starch, and, as mentioned above, probably suggests an explanation of the widely differing results of other observers.

The different mucilages were all prepared as described above, and quantities of mucilage representing ·05, ·1 and ·5 grm. of each starch (dried) introduced into the bottles, the bulk of each being made up to 50 cc. with distilled water, and ·5 grm. of extract of malt added to each.—*Phar. Jour. and Trans.*, Dec. 21, 1889, p 481

THE INFLUENCE OF ARTIFICIAL GASTRIC JUICE ON THE ACETOUS AND LACTIC ACID FERMENTATIONS.

By F. O. Cohn.

Of the views held concerning the origin of the hydrochloric acid in the gastric juice, one of the most generally accepted is that lactic acid formed from carbo-hydrates, liberates hydrochloric acid, by acting on sodium chloride (Ewald). At the same time, it is well known that acidity stops fermentative processes, and it is therefore important to determine accurately what influence gastric juice exerts on the acetic acid and lactic acid fermentations, and what concentration of hydrochloric acid stops the fermentation.

In the present research an artificial gastric juice was made with the *Pepsinum germanicum* of Witte of Rostock ; the micro-organisms of the acetic and of the lactic fermentations were grown in suitable saline media. This was titrated with normal sodium hydroxide solution before and after infection with the micro-organisms in question. The influence on the rate of fermentation of (1) pepsin, (2) hydrochloric acid, (3) pepsin and hydrochloric acid, and (4) hydrochloric acid in the presence of peptone, was investigated ; some experiments were also made to determine the amount of decomposition of phosphates brought about by hydrochloric acid.

The results obtained were as follows :

(1) Pepsin does not hinder either the acetic or the lactic acid

[1] *Zeit. physiol. Chem.*, xiv, 75–105, *Jour. Chem. Soc.*, 1889, p. 1227.

fermentations, but it appears to be a good nitrogenous pabulum for the organisms.

(2) Even traces of hydrochloric acid hinder the acetic fermentation. The lactic fermentation is stopped by just so much hydrochloric acid as is necessary to change the phosphates (which are present in the nutritive liquid for the proper growth of the *Bacterium acidi lactici*) into chlorides. The fermentation was thus probably hindered by the hydrogen phosphate thus liberated.

(3) Pepsin and hydrochloric acid together act in the same way as hydrochloric acid alone, only not quite so powerfully.

(4) Hydrochloric acid in the presence of (probably combined with) peptone, does not hinder the fermentations at all. It is also useless in aiding the digestion of albumen by pepsin.

(5) The acetic acid fermentation is hindered by hydrochloric acid when sufficient has been added to liberate from 0·5 to 0·7 parts per thousand of hydrogen phosphate from the phosphates present.

OIL OF ROSEMARY.

By E. M. Holmes, F.L.S.,
Curator of the Museum of the Pharmaceutical Society.

During the present month two samples of essential oils, obtained from plants grown in Sussex, have been presented to the Museum. One is the oil of rosemary and the other that of lavender, both distilled at Brighton, from the plants grown there by Mr. Sawer (see vol. xv, p. 125). With these specimens some information is contributed concerning the details of the preparation of the oil of rosemary, which seems sufficiently interesting for publication.

Mr. Sawer states that he first experimented with plants raised from seeds, which had been collected probably in the south of France, but these yielded a rank oil. He then obtained cuttings from old gardens in England, and found that if planted in August, they strike rapidly, especially if pulled off with a "heel" or woody portion, and shaded from the sun. It was found that light loam answers best, and that the cuttings succeed best in wooden boxes. Mr. Sawer recognizes two distinct forms of rosemary, the one having a larger leaf, which is more hoary underneath than the other; both, however, seem equally fragrant, and he mixes them in equal proportions for distillation. Rosemary is by no means easy to grow

everywhere, requiring a warm, sheltered and somewhat dry situation. In a damp atmosphere, or where shaded by trees, or in a rich soil, it is apt to grow rapidly and form long herbaceous shoots, and the plant is then liable to be killed by the frost. In order to harden the plants and prevent their too rapid growth, the young plants are placed in rows at least four feet apart, with 18 inches or two feet between each plant, on a dry calcareous sloping ground. The chalk on which they grow holds sufficient moisture in summer and yet provides good drainage in winter. At the beginning of September, the young shoots are carefully and evenly cut, with a strong pair of sheep shears, right down to the wood, and the plants soon form a compact stunted hedge about 18 inches high. The old leaves remain on the plant a considerable time, not shrivelling off as do those of lavender. The only manure he gives is cinder ash in abundance, and the spent leaves from the still. The plants are fully exposed to sea air at a considerable elevation about two or three miles from the sea. This Mr. Sawer considers beneficial to their growth, the name Rosemary (*Ros marinus*) almost implying that their native habitat is near the sea.

For purposes of distillation, the young shoots are cut at the end of August or beginning of September, and separated from the wood, *i. e.*, the ends of the main branches, as much as possible. The twigs are then packed tightly into a perforated copper vessel, which is covered with a perforated copper lid, and the whole is lifted into the still by pulley tackle. If the wood is not removed much space is wasted and the oil acquires a turpentiny rankness. If the rosemary is not distilled soon after being gathered, it is liable to heat, and if spread out till the next day, Mr. Sawer believes it would lose much fragrance. Cold water is let into the still until it rises nearly to the level or within an inch of the lid, the head of the still is then luted on and clamped, and the mass left to become saturated with water until the next morning. The fire is then lit and when the water begins to boil the oil distils over. That which comes over during the first twenty-five or thirty minutes is the finest; that which comes over afterward is small in quantity, inferior in quality, and apt to spoil the rest if allowed to distil into it. A worm of tin pipe in a galvanized iron cylinder is used as a condenser. The place chosen, on the dry chalky South Downs, in proximity to the sea, is perhaps the very best that could be selected in this country for a

plant whose native home is on the sunny shores of the Mediterranean.

There appears to be no reason why English oil of rosemary should not be obtained of the greatest purity and of the finest flavor under such favorable conditions, when skill and care are also applied to its production. Mr. Sawer promises details concerning the distillation of lavender at a future date.—*Phar. Jour. and Trans.*, Jan. 25, p. 581.

ISOMERIDE OF MONOBROMOCAMPHOR.[1]

By F. Cazeneuve.

Hypobromous acid is prepared by the action of bromine on mercuric oxide suspended in water cooled at 0°, and powdered camphor is agitated briskly with the solution. It forms a reddish-orange liquid, which is washed with cold water, dissolved in alcohol of 93°, agitated with a slight excess of potassium hydroxide to remove bromine, precipitated by the addition of water, washed, dried and finally crystallized from alcohol of 85°, and from chloroform.

The monobromocamphor thus obtained forms ill-defined crystals, which melt at 144–145°, whilst ordinary monobromocamphor melts at 76°. It is insoluble in water, but readily dissolves in alcohol, benzene, ether, and chloroform. A 5·5 per cent. solution in alcohol of 93° has a rotatory power of $[\alpha]_D = +40°$, which is identical with that of the monochlorcamphor obtained by the action of hypochlorous acid (preceding abstract). With water and dilute acids at high temperatures, with ammonia, and in all reactions (*loc. cit.*) the two derivatives behave in a precisely similar manner. They are therefore doubtless similar in constitution, and the bromine has displaced hydrogen in a CH_2 group of the nucleus.

The monochloro- and monobromo-derivatives obtained respectively by the direct action of bromine, or the action of chlorine in presence of alcohol, contain the halogen in the ortho-relation to the carboxyl. It is probable that the isomerides contain the halogen in the para-relation, but they may also be regarded as ethereal salts of a secondary alcohol with the CH.OH group in the nucleus. The latter view is supported by the liberation of hydrochloric or hydrobromic acid by the action of water or dilute sulphuric acid at 150°, and by the production of amines on treatment with ammonia.

[1] *Compt. rend.*, cix, 439–441; *Jour. Chem. Soc*, 1889, p, 1204.

JALAP AND JALAP RESIN.[1]

By F. A. Flückiger.

The resin of jalap is a much-used remedy, not yet supplanted by synthesis, which medicine, apparently, would not willingly be deprived of. But for nearly twenty years the fact has been becoming more and more evident that the tubers of *Ipomœa purga*, the only material used in Europe and America in the preparation of resina jalapæ, yield less of that substance than in former times. In 1842, Guibourt, experienced and careful in such matters, found no less than 17·65 per cent. of the resin, and statements varying between this amount and 10 per cent. were about that time not infrequent, if I read correctly. The authors of "Pharmacographia" have brought together (p. 445) a few statements on the subject from the circle of their friends and acquaintances; the older drug houses would probably be in a position to contribute towards making them more complete. But probably, for the last twenty years, as it appears to me, the statements of 10 per cent. yields, or upwards, have been fewer, and the larger proportion of the jalap has yielded less, frequently only a small percentage of resin.

Whence this phenomenon? The complaint that the drug appeared inferior or consisted of smaller tubers, has by no means been heard during the same time; indeed to my knowledge it has not been proved that the larger and older pieces are richer in resin. Reasons for an actual retrogression in the resin formation in the root organism of the jalap plant are not conceivable, so that one is brought to the presumption that a fraudulent abstraction from the jalap takes place. Of this Dr. Squibb in the latest number of the *Ephemeris* (July, 1889,) presents an indication the importance of which should not be underestimated. He made applications in Hamburg, London and New York to be supplied with the finest jalap in considerable parcels, but obtained only one consignment that yielded more than 7½ per cent. of resin. One house in New York, not more exactly specified by him, sent a representative to the district in Mexico that formerly yielded jalap and authorized him to purchase the root at any price on the spot. Two hundred pounds obtained in this way yielded 16·9 per cent. of resin. A fur-

[1] From the *Journal der Pharmacie*, von Elsass-Lothringen, for November.

ther quantity of some hundreds of pounds, from the neighborhood of Xalapa and Perote, was on its way.

It may therefore be probably assumed that the dealer in Mexico has acquired sufficient chemical knowledge to wash the jalap with alcohol. If it were previously charred by suitable drying at a fire it would not undergo any remarkable change through a short immersion in alcohol; and it may easily be demonstrated that if the root is previously bruised this is never the case.

The jalap plant first reached Europe in 1830, through Schiede, and was successfully cultivated in Cassel, Munich and other places; since that time many botanical gardens have possessed the plant. In July, 1834, Apotheker Widnmann, of Munich, examined a jalap tuber grown in that city, which was so juicy that there remained after drying only 10·9 per cent. This dried substance gave up to absolute alcohol a quantity of resin equal to 2·479 per cent., calculated on the fresh root, or 22·74 per cent. of the dried material. So far as I know a jalap richer in resin was never met with. It is probable that the observer may be credited that he actually had to do with the jalap resin (convolvulin), the more so as he adds that it was pale yellow, easily friable and insoluble in ether.[1] The dried root is described by Widnmann as being remarkably pale; no wonder therefore that the resin should be only yellowish and not brown.

The work of the Munich pharmacist moreover finds confirmation in an investigation carried out at Bonn by Clamor Marquart, of a jalap root, originating from the same consignment, by Schiede, as Widnmann's, and which was grown at Cassel by Wild. The root, when dried, yielded 12 per cent. of a yellow resin, soluble in caustic potash solution and fuming nitric acid, but not in ether, which only took up a minute quantity.

There is no doubt, therefore, that roots from jalap plants grown in Germany in the open air may be remarkably rich in resin; that in Munich over 20 per cent. of resin was produced, and in Cassel only half as much does not affect the matter. It is only now necessary to bring these experiments again prominently into the light in order that agriculturists may be provoked to the cultivation of the jalap plant, which probably would bring greater profit than many

[1] Buchner's *Repertorium für Pharmacie*, vol. liv (1835), p. 222.

more difficult crops. That any specially great difficulties would have to be overcome in the cultivation of the jalap plant is probably scarcely to be feared, since it is stated in the paper already quoted (p. 232), that Schiede's consignment of jalap tubers supported in the winter of 1829–30, on board ship in the Elbe, a temperature of —20° R., and at Munich the plants did better in the cold-house, and afterwards in the open air, than in the hot-house. Even at that time the gardener who had the matter in hand at Cassel recommended the cultivation of jalap in Germany.

Although, however, this may not turn out so simple as might be wished, it may be inferred from the few experiments recalled, that it must be practicable somewhere in Europe, by the cultivation of the jalap plant, to render a service to medicine and to make a good business.

The genera *Convolvulus* and *Ipomœa* are distributed in warm and hot countries especially, to the extent of some five hundred species. Probably all this enormous number of plants contain one or other of the resins jalapin (jalapurgin, convolvulin) or orizabin; possibly also other members of the same homologous series in which these two resins have up to the present stood alone. Accident has determined that medicine-requiring humanity in Mexico has lighted upon these two species of *Ipomœa*, *I. purga* and *I. orizabensis*, rather than upon some other American species.

Neither in Asia are there wanting powerfully drastic species of *Ipomœa*. Possibly the presumed fraudulent deprivation of the Mexican jalap may be successfully combated by means of the still onger used *Ipomœa Turpethum*, but this root appears to me to be ess productive. On the other hand I have long since shown "Pharmacographia," 1st edit., p. 403,) that from the seeds of *Ipomœa hederacea*, Jacquin (*I. Nil*, Roth.; *Pharbitis Nil*, Choisy) over 8 per cent. of resin can be obtained, which is identical with that from *Ipomœa purga*. This resin (jalapurgin or convolvulin) can be removed with the greatest ease by means of alcohol from the seeds, after they have been freed from fat and powdered, and is obtained nearly pure at the first attempt. Instead of the unsightly preparation to which European pharmacopœias give prominence under the name resina jalapæ, the kaladana seeds yield the same substance only slightly colored. This far better looking resin obtained a place in the Pharmacopœia of India as far back as 1868, and

probably it is only the power of habit that stands in the way of its general introduction. Even in England kaladana resin has met with no acceptance in comparison with less easily obtained scammonium, which is there so remarkably favored. Further, the kaladana plant (figured in the *Bot. Mag.*, t. 5720; not so well in Bentley and Trimen, "Med. Pl.," 185) has the great advantage over *Ipomœa purga* that it is an annual and extraordinarily widely distributed. Not only is it quite common in India (Dymock, "Mat. Med. W. I.," 1885, 561), but it flourishes everywhere in warm and hot countries. If, therefore, there were any demand established, presumably there would not be the slightest difficulty in harvesting suitable quantities of the seed. The 14 per cent. of fat that would have first to be separated would remunerate for a portion of the work.

It remains a question whether the presumption of an abundant yield of seed would be realized in an agricultural experiment with this *Ipomœa*. If this were actually the case it would seem to be folly that the English government should take so much trouble to acclimatize the Mexican jalap plant in Jamaica and India. From the standpoint of the resin it would be much better to apply this care to the kaladana plant. Japan also possesses in *Ipomœa triloba*, or *Pharbitis triloba*, a species from the seed of which the same resin as from jalap was obtained last year in the laboratory of my colleague and friend, Shimoyama, Director of the Pharmacological Institute of the University of Tokio.—*Phar. Jour. and Trans.*, Jan. 11, p. 546.

CHEMICALLY PURE NARCEINE.

By E. Merck.

In a note, entitled "Narceine and its Salts,"[1] D. B. Dott refers to the contributions to the knowledge of narceine that have appeared during the last three years. As the results to some extent of my work are spoken of in terms of unfavorable criticism, I feel called upon to bring forward the following facts:

Chemically pure narceine was not hitherto obtainable in commerce. I have, on the contrary, pointed out that the samples of English narceine examined by me during a series of years did not consist of the free base, but were basic salts—hydrochlorides, acetates and

[1] Read at the Newcastle meeting of the British Pharmaceutical Conference.

sulphates--and that in addition they contained other substances in varying quantities.

Since a theory has value only when it is supported by experimentally proved facts, I have not, in the absence of such experiments, spoken more definitely upon the chemical nature of these samples of narceine containing acid, but in print have only stated that they are "probably to be considered as basic salts."

Dott appears to have overlooked this, since he ascribes to me that I look upon these substances as mixtures of free base and normal salts. However, I willingly concede that the expression selected by me in one place might furnish opportunity for an error in the sense indicated, though my intention was to mention in that place the results of an analysis showing the presence of hydrochloric acid in narceine, simply because that very interesting fact was thus brought under notice in the most drastic manner.

As to the collision with Wright's investigations upon narceine hydrochloride, I may remark that my object was to illustrate the difficulties attending the attempt to remove the whole of the acid from commercial narceine. With that object I selected a sample of narceine containing hydrochloric acid, and in that respect corresponding to the majority of the preparations tested, but the same results hold good for narceine containing either acetic acid or sulphuric acid.

The fact then observed was that narceine crystallized out from 50 per cent. alcohol, and even in the presence of free ammonia, still contained hydrochloric acid, and that fact was at any rate so surprising and so new that a closer investigation appeared to be justified.

It can easily be ascertained by experiment that, contrary to Dott's statement, narceine containing hydrochloric acid cannot be perfectly freed from the acid by recrystallization.

In the case before us I cannot agree with the views of Dott upon the limited importance of the melting point as a means of establishing the purity of certain alkaloids, for it is only when narceine is absolutely free from acid and other foreign admixtures that it melts above 170° C.

In respect to the use of the alkaloid it was expressly stated that "good commercial narceine might fully suffice for therapeutic use;" but the chemist must be more thorough-going in his requirements

as to the purity of narceine, and the object of my communication was to show that.

There has also come under my notice the communication from P. C. Plugge,[2] which I am equally unable to leave unanswered.

Herr Plugge appears to be annoyed because I have left unmentioned his work upon narceine, the chief point of which is the not very novel classification[3] of the opium alkaloids into strong and weak bases. But there was no ground for me to quote Plugge's results, as I occupied myself with the preparation of chemically pure narceine, and in doing so could not mention all the communications that have appeared upon that alkaloid, but only those standing in direct connection with my subject.

However, it is by no means the case that I have anywhere asserted in opposition to previous authors that narceine is not a weak base. The purport of the passage which Plugge quotes from my communication is to some extent distorted through the absence of subsequent passages and an opinion is attributed to me which I never held and have never expressed. What I wished to bring out was that chemically pure narceine, contrary to previous statements, possesses a *weak alkaline reaction*, and that it manifests quite a *peculiar affinity for acids*, on which account it holds an exceptional position among the opium alkaloids.

The assumption by Plugge that narceine and acetic acid do not combine chemically is a false one; presumably he could not have worked with chemically pure narceine. In a water solution certainly decomposition does take place; but if chemically pure narceine be moistened with acetic acid, allowed to dry, and the residue powdered, the odorless powder so obtained does not either by weeks of exposure to the air or by four hours' heating to 70° C. lose the acetic acid to which its strong acid reaction is due, a certain proof that this is chemically combined.

Because this fact cannot be brought into record with one of Plugge's conclusions, he contents himself with describing this experiment as "*somewhat strange*, and one to which no value is to be ascribed." I feel myself compelled to declare in this place, once for all, that in future I shall not be induced to take seriously into

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[2] See AMER. JOUR. PHAR., January, 1890, p. 34.

[3] See Hesse's classical papers, *Annalen*, cliii, Suppl., viii, etc.

consideration any statements as to the chemical nature of narceine, if they are not based upon experiments with chemically pure narceine.

The extremely contradictory results which I have myself obtained through a series of years with the commercial narceine formerly accepted as pure, was the occasion of my taking part in the settlement of the chemical properties of chemically pure narceine, and in this sense I hoped to interest chemists by my small communication.

In conclusion, I would take this opportunity to mention that I have succeeded in obtaining two of the rarest opium alkaloids, namely, *laudanine* and *protopine*. I found their properties to correspond essentially with the statements made by Hesse at the time he discovered them. Laudanine, especially, on account of its analogy to morphine, appears to be of great interest. It is soluble in caustic soda solution and can be converted by methylation into a new base, which chemically resembles codeine.—*Phar. Jour. and Trans.*, Dec. 21, 1889, p. 482.

SOME INCOMPATIBILITIES OF ANTIPYRIN.

If liquid extract of cinchona be added to a solution of antipyrin in distilled water, a dense reddish brown precipitate is formed, which contains tannic acid and antipyrin. The greater part of this precipitate dissolves on the addition of dilute sulphuric acid, the insoluble portion being probably the coloring matter of the bark, for if a solution of tannic acid be used instead of the liquid extract of cinchona as a precipitating agent, a precipitate forms, which entirely and easily dissolves on the addition of the dilute sulphuric acid. It follows, therefore, that decoctions, infusions, and tinctures containing tannic acid should act in the same manner. The effect, however, produced by these preparations is very small compared with the liquid extract of cinchona. Antipyrin is not precipitated by solutions of the alkaloids quinine, cinchonine, or cinchonidine. Therefore, it can be prescribed in a mixture containing sulphate of quinine and dilute sulphuric acid. When strong solutions of chloral hydrate and antipyrin are mixed, a white precipitate is formed, which soon becomes resolved into globules of oily-looking liquid, which sink to the bottom in a distinct layer. This layer in the course of some hours changes into a crystalline

mass, from which the clear upper liquid can be drained off. These crystals are soluble in water, but considerably less so than either antipyrin or chloral hydrate. They have a distinct taste of chloral without its pungency, and they are not so bitter as antipyrin. This precipitation does not occur in dilute solutions, and it is possible to mix a solution containing sixty grains of antipyrin to the fluid ounce with one containing the same proportion of chloral hydrate without any precipitate being immediately formed, although in a few hours small crystals begin to appear. A solution containing fifteen grains each of antipyrin and chloral hydrate to the fluid ounce appears to be a permanent one, for at the end of a week there is no appearance of crystalline matter. Clinical experience alone can determine whether mixtures of these two bodies possess any therapeutic properties different from those of the consituents. In prescribing them together, it is to be borne in mind that the solutions must be dilute.—*British Medical Journal*, November 16, 1889.

CHLORALAMID AS A HYPNOTIC.[1]

By W. Hale White, M.D., F.R.C.P.,

Senior Assistant Physician to, and Lecturer on Materia Medica and Therapeutics at, Guy's Hospital.

In his exhaustive account[2] of many of the new hypnotics, Prof. Leech says of chloralamid that the observations upon it are so far few in number. I have recently given it to twenty patients suffering from various illnesses, in all of whom insomnia was a troublesome symptom. Brief notes are appended. It will be seen that the drug produced comfortable sleep in all the patients except two; one of these was suffering from delirium connected with cerebral hemorrhage, and the other was admitted with rheumatic fever complicated by delirium tremens and salicylic poisoning. Both these patients died shortly after admission. It is noteworthy that some of the other patients were suffering from extremely painful diseases, and yet chloralamid produced sleep; thus a woman who had a thoracic aneurysm preferred it to morphine, and another patient who had carcinoma of the stomach also slept better with chloralamid than with morphine. The patient with carcinoma of the liver suffered intense pain, yet she dozed comfortably after chloralamid.

[1] Abstract from a paper published in *British Medical Journal.*

[2] *Journal*, November 2, 1889, p. 969.

The man suffering from cerebral softening who was quieted by the drug is also a striking case. Probably the house physicians, sisters, and nurses are the best judges of hypnotics, as they see the patients frequently during the night. They all tell me that those who take chloralamid sleep well and comfortably after it, and the sisters of the three wards in which I have used it tell me that the patients sleep better after chloralamid than after any of the hypnotics which have been introduced during the last few years. My own experience, and what the patients themselves tell me certainly agree with this. In none of the twenty patients to whom I have given it—and many of them have taken several doses—have any effects followed that can be looked upon as contra-indications to its use. Never have I observed any depressing results, nor has headache followed its use. The time which elapses between its administration and the commencement of sleep varies between a quarter of an hour and two or three hours. If it is given in the evening, when once asleep the patient usually sleeps quietly till morning. Some writers have stated that occasionally after a dose in the evening the patient does not go to sleep till the next morning, and that he remains asleep all the day. This was so with one of my patients; but it must be remembered that, as the drug is feebly soluble in water—20 grains take five hours to dissolve in 2 ounces of water—it is often given as a powder with some milk. It was administered in this way to my patient who slept the next day, and I should think that some of these cases of delayed action were due to delayed absorption. Now I always prescribe it with spirit; 20 grains will dissolve in 1 drachm of rectified spirit in fifteen minutes, and water may be added to this solution without reprecipitating the drug. A good way of giving it is to tell the patient to dissolve it in a little brandy, add water to his liking, and drink it shortly before going to bed. If given in milk, not only is it insoluble, but it is difficult to swallow, for it sticks to the sides and bottom of the glass. The taste is slightly bitter, but by no means disagreeable. It should never be prescribed with alkalies, for they decompose it, nor should hot water be mixed with it, for it decomposes at 148° F. For an adult, 20 to 60 grains—the exact amount depending upon the cause of the insomnia—is the dose; usually 30 grains will suffice. It has the advantage over sulphonal that it is only half the price, and it has the great advantage over paraldehyde that it has no nasty smell or taste, nor is it difficult to dissolve.

It would seem that in chloralamid we have a safe hypnotic, which hardly ever has any depressing effects, which does not produce indigestion, and very rarely gives rise to any unpleasant results. We do not, of course, yet know what harm may result from its prolonged use. References to those authors who have studied the chemistry and physiological action of the drug will be found recorded by Leech, Paterson,[3] and in a leading article in the *Therapeutic Gazette*, for September, 1889. Rabaw[4] considers 45 grains of chloralamid to be equivalent to 30 grains of chloral. Chloralamid has been used successfully as an enema by Peiper.[5]

SULPHITES.[1]

By P. J. Hartog.

Normal potassium sulphite is obtained by dissolving 100 grams of potassium hydroxide in 200 cc. of water free from oxygen, saturating with sulphurous anhydride, and then adding a further quantity of 100 grams of potassium hydroxide dissolved in as little water as possible. The solution is evaporated in a vacuum, and the crystals are drained on cotton wool in an atmosphere of nitrogen. Since the salt is less soluble in hot water than in cold, it is advisable to keep the funnel warm when collecting the crystals. The sulphite is thus obtained in small, anhydrous, hexagonal prisms with basal modifications. It is deliquescent, but oxidizes less rapidly than its solution; heat of dissolution — 1·75 Cal.

Normal sodium sulphite is obtained in the same way in anhydrous crystals of the same form, always mixed, however, with a certain proportion of the heptahydrated salt; heat of dissolution + 2 71.

Sodium potassium sulphite, $NaKSO_3$, is obtained in crystals, which resemble those of the simple anhydrous salts, by adding potassium hydroxide to sodium anhydrosulphite. When the solution of the double sulphite has been partially oxidized, and is then gradually concentrated, the crystals which separate are first hepta-

[3] *Lancet*, October 26, 1889.

[4] *Centralblatt für Nervenheilkunde*, August 1, 1889.

[5] *Deutsche Med. Woch.*, August 8, 1889.

[1] *Compt. rend.*, cix; reprinted from *Jour. Chem. Soc.*, Dec., 1889, p. 1106. Compare also Amer. Jour. Phar., 1889, p. 584.

hydrated sodium sulphite, then the double sulphite, and lastly potassium sulphate; hence it would seem that at first the potassium sulphite alone undergoes oxidation. Heat of dissolution of the double salt — 1·19 Cal.; heat of dissolution of hydrated sodium sulphite in a solution of potassium sulphite — 11·01 Cal.; heat of formation of the double sulphite + 3·76 Cal.

When a solution containing potassium and ammonium sulphites in equivalent proportions is concentrated, the first crystals consist solely of potassium anhydrosulphite. These are followed by monohydrated ammonium sulphite, in which part of the base is replaced by potassium. In presence of a large excess of ammonia, hexagonal prisms of the composition $1{\cdot}14(NH_4)_2O$, $0{\cdot}86K_2O,2SO_2$ are obtained, together with acicular crystals of the composition $K_2O,10(NH_4)_2O,-11SO_2+11H_2O$. This salt dissociates at the ordinary temperature, and if it is enclosed in a sealed tube containing nitrogen, ammonium sulphite condenses in the upper part of the tube.

No sodium ammonium sulphite could be obtained.

The double sulphite, $2Na_2O,K_2O,4SO_2+9H_2O$, is obtained by saturating two molecular proportions of sodium carbonate with sulphurous anhydride, adding one molecular proportion of potassium carbonate and concentrating. It separates in rounded crystals which cannot be dehydrated without decomposition. At 90° the salt undergoes no change, and at 100–110° it loses water and sulphurous anhydride. Heat of dissolution, — 30·39 Cal.; heat developed by the action of potassium oxide on two molecular proportions of sodium anhydrosulphite, + 16·81 Cal.; heat of formation of the double salt, + 25·88 Cal.

The salt $2Na_2O,(NH_4)_2O,4SO_2+9H_2O$ always separates from mixtures of sodium and ammonium sulphites. It can readily be obtained in a crystalline form by passing ammonia gas into a saturated solution of sodium hydrogen sulphite. Its heat of dissolution is — 30·72 Cal. The action of ammonia on sodium anhydrosulphite develops + 15·68 Cal.; the formation of the solid salt from $2Na_2SO_3$ sol + $(NH_4)_2S_2O_5$ sol + $9H_2O$ sol, therefore, develops + 19·62 Cal.

An analogous potassium compound also exists.

The reaction $2Na_2S_2O_5+(NH_4)_2O$ develops + 15 68 Cal. if the solution of the sodium salt is freshly prepared, but only 12·94 Cal. if the solution has been kept in an atmosphere of nitrogen for three months. The author distinguishes the two modifications as *α*- and

β-, and it is evident that the conversion of the former into the latter develops + 2·74 Cal. The action of ammonia on the double salt just described develops + 23·52 Cal. if it has been prepared from anhydrosulphite α; + 23·87 Cal., if from anhydrosulphite β; and + 23·87 Cal. if from Marignac's salt.

Berthelot has shown (*Ann. Chim. Phys.* [6], iii, 242), that a solution which contains 2 mols. of sulphurous anhydride and 1 mol. of potassium oxide alters spontaneously with development of + 2·6 Cal., 2 mols. of potassium hydrogen sulphite forming 1 mol. of the anhydrosulphite with elimination of water. According to de Forcrand, no similar change occurs with the sodium salt, but the fact that a similar thermal disturbance is observed seems to point to the opposite conclusion.

The action of two successive molecules of ammonium oxide on the two molecules of potassium anhydrosulphite develops + 25·05 Cal. and 23·32 Cal., respectively, the corresponding values for the α-sodium salt being 26·16 Cal. and 23·52 Cal., and for the β-salt 23·42 Cal. and 23·87 Cal., respectively. The fact that the heat of neutralization of the fourth acid function by ammonia is less than the heat of neutralization of the first three, indicates that the anhydrosulphites contain four equivalents of metal in the molecule. With sodium or potassium hydroxide in place of ammonia, however, the four heats of neutralization are identical. Nevertheless the author considers that this view is supported by the existence of double sulphites, such as $3MgO,Am_2O,4SO_2 + 18H_2O$ and $3CdO,Na_2O,4SO_2$.

REACTION BETWEEN SOLUTIONS OF FERRIC CHLORIDE AND POTASSIUM IODIDE.

By D. J. Carnegie.

The decomposition of acid solutions of potassium iodide appears to be a function of time and temperature; it can be arrested by surrounding them with an inert atmosphere, except when the solutions are strong and the temperature high.

The author has made numerous experiments with solutions of potassium iodide and ferric chloride of known strength, and although many of his results indicate that a ratio of 1 mol. of KI to 1 atom

[1] *Chem. News*, lx, 87–90; *Jour. Chem. Soc.*, Dec., 1889, 1113.

of Fe is sufficient to effect the decomposition, yet, by taking into consideration the conditions of the experiment and the various secondary reactions, he considers that the equation: — $FeCl_3 + 3KI = FeI_2 + I + 3KCl$, is more probably the correct representation of the reaction than the equation: — $FeCl_3 + KI = FeCl_2 + KCl + I$. For the volumetric estimation of ferric iron, the ratio Fe to liberated iodine is alone considered, and is the same in both equations. The distillation method is considered preferable to the digestion process. The solution of potassium iodide is placed in the flask, saturated with carbonic anhydride, the ferric solution added, and distillation proceeded with as rapidly as possible; the volatilized iodine being caught in potassium iodide solution saturated with carbonic anhydride (to neutralize any hydroxide present). For the distillation, it is convenient to have the delivery-tube ground into the neck of the flask, so as to permit of speedy detachment; for the delivery of the thiosulphate, the author employs an improvised "stillimeter," on the principle of Mariotte's bottle. The "after-bluing" of the starch, sometimes observed in the titration, is considered as due to the sodium iodide formed during the titration, reinforcing the small residue of potassium iodide, which, in its turn, reacts on the residual ferric chloride, establishing a fresh equilibrium, until some more thiosulphate is added, when the same reactions take place again, until all the ferric chloride is destroyed.

It is pointed out that commercial potassium iodide nearly invariably contains sufficient free potash to vitiate in some degree all iodometric estimations effected with its aid. The potassium iodide solution used to absorb the iodine liberated in such estimations should be supersaturated with carbonic anhydride previous to use.

UNOFFICIAL FORMULARY ADDENDUM.[1]

ACIDUM HYDROCYANICUM (Scheele)—*Hydrocyanic Acid* (Scheele).

Take of—

Ferrocyanide of potassium,	2¼ oz.
Sulphuric acid,	1 fluid oz.
Distilled water, 24 fl. oz., or a sufficient quantity.	

Dissolve the ferrocyanide of potassium in 10 ounces of the water, then add the sulphuric acid, previously diluted with 4 ounces of the water and cooled. Put the solution into a flask, to which are attached a condenser and a receiver

[1] *Year-book of Pharmacy*, 1889, published by the British Pharmaceutical Conference.

arranged for distillation, and having previously put 1 ounce of distilled water into the receiver, and provided efficient means for keeping the condenser and receiver cold, cautiously apply heat to the flask, until by slow distillation the liquid in the receiver is increased to 10 fluid ounces. Add to the product as much water as may be sufficient to bring the acid to the required strength.

Characters and Tests. — A colorless liquid. Specific gravity, 0·994. A fluid drachm of it leaves on evaporation no fixed residue. It gives no precipitate with chloride of barium, but with nitrate of silver it yields a white precipitate, entirely soluble in boiling concentrated nitric acid. Its strength, as determined by the process of the British Pharmacopœia by means of volumetric solution of nitrate of silver, corresponds to 4 per cent. of hydrocyanic acid.

Dose.—1 to 4 minims.

Acidum Hypophosphorosum—*Hypophosphorous Acid.*

Take of—

Hypophosphite of barium, ... 8 oz.
(Containing not less than 95 per cent. $Ba_2(PH^2O^2)H^2O$).

Diluted sulphuric acid, Distilled water, of each a sufficient quantity.

Dissolve the hypophosphite of barium in 36 fluid ounces of hot distilled water. Add slowly to the solution 17 fluid ounces of diluted sulphuric acid, after which continue the addition, drop by drop, until no further turbidity is produced. Set aside in a warm place, and pass the clear liquid through a filter. Wash the precipitate by decantation with successive portions of hot distilled water, until the washings have no longer an acid reaction. Filter, unite the filtrates, and evaporate the liquid on a water-bath to the prescribed density. The product will weigh about 11½ ounces.

Characters and Tests.—Colorless. Specific gravity, 1·1367. Its strength, as determined by volumetric solution of soda, corresponds to 30 per cent. of hypophosphorous acid. Its aqueous solution is not precipitated by diluted sulphuric acid, nor by an excess of ammonia, nor by oxalate of ammonia after neutralization, and gives not more than a faint opalescence with chloride of barium. If solution of ammonio-sulphate of magnesium be added after an excess of ammonia, no precipitate is produced. Chloride of calcium added to a neutralized solution yields no precipitate.

Dose.—2 to 5 minims.

Chloroformum Aconiti—*Chloroform of Aconite.*

Take of—

Aconite root, ... 20 oz.
Strong solution of ammonia, ... 1½ fl. oz.
Distilled water, ... 1 pint.
Chloroform, a sufficient quantity.

Bruise the aconite root, and moisten thoroughly with the strong solution of ammonia and distilled water previously mixed. Macerate for four hours, dry carefully, and reduce to No. 40 powder. Pack tightly in a percolator provided

with a tap and closely-fitting cover. Macerate for twenty-four hours with 20 fluid ounces of chloroform, then pour on successive quantities of chloroform, percolating slowly until 30 fluid ounces are obtained.

CHLOROFORMUM BELLADONNÆ—*Chloroform of Belladonna.*

Prepared as chloroform of aconite (*q.v.*), substituting belladonna root for aconite.

CHLOROFORMUM CAMPHORATUM—*Camphorated Chloroform.*

Take of—

Camphor, ... 2 oz.
Chloroform, ... 1 fl. oz.
Dissolve.

ELIXIR SENNÆ—*Elixir of Senna.*

Take of—

Alexandrian senna, ... 1 pound.
Refined sugar, in coarse powder, ... 12 oz.
Rectified spirit, Distilled water, of each a sufficient quantity.

Mix 4 fluid ounces of rectified spirit with 12 fluid ounces of water, and with it moisten evenly the senna. Pack tightly in a closed vessel, and macerate for three days. Express forcibly, and pour the product on the sugar. Break up the marc, and add to it sufficient of the same menstruum to furnish in all 16 fluid ounces of product. Express again after twenty-four hours' maceration, add the liquor to the previously obtained product and the sugar, heat in a closed vessel by means of a water-bath to 200° F., and maintain at that temperature for ten minutes. When cold strain and add, after mixing—

Chloroform, ... 24 minims.
Oil of coriander, ... 2½ "
Tincture of capsicum, ... ½ fl. drm.
Rectified spirit, ... 3 "

Agitate thoroughly, and if necessary, add proof spirit to make the product measure 24 fluid ounces.

Dose.—1 to 3 fluid drachms.

EXTRACTUM HÆMATOXYLI LIQUIDUM—*Liquid Extract of Logwood.*

Take of—

Unfermented logwood in No. 16 powder, ... 20 oz.
Distilled water, ... 6 pints.

Boil the logwood with two pints of water in a covered copper or enamelled pan for half an hour, and strain. Add two pints of water, boil for another half-hour, and again strain. Repeat the process for a third time, and having mixed the strained liquors, evaporate over a water-bath (or preferably *in vacuo*) until the product measures 1 pint. Set aside for seven days, and then decant the clear liquor by means of a siphon from any sediment that may have been deposited.

Dose.—½ to 2 fluid drachms.

SYRUPUS CALCII HYPOPHOSPHITIS—*Syrup of Hypophosphite of Calcium.*

Take of—

Hypophosphite of calcium, ... 160 grains.
Distilled water, ... 9 fluid oz.

Dissolve and filter. To the filtered solution add—

Refined sugar, ... 1 pound.

Dissolve with the aid of a little heat, strain, and add after cooling,

Hypophosphorous acid, ... 20 minims.

Distilled water, sufficient to produce 1 pint.

Mix. Each fluid drachm contains 1 grain of hypophosphite of calcium.

Dose.—1 to 4 fluid drachms.

SYRUPUS SODII HYPOPHOSPHITIS—*Syrup of Hypophosphite of Sodium.*

Take of—

Hypophosphite of sodium, ... 160 grains.
Distilled water, ... 3 fluid drms.

Dissolve, filter, and wash the filter with distilled water, 1 fluid drachm. To the filtered solution add—

Syrup, sufficient to produce, ... 1 pint.

Mix. Each fluid drachm contains 1 grain of hypophosphite of sodium.

Dose.—1 to 4 fluid drachms.

MINUTES OF THE PHARMACEUTICAL MEETING.

PHILADELPHIA, February 18, 1890.

The meeting was called to order by asking Mr. Alonzo Robbins to preside. In the absence of the Actuary, Dr. C. B. Lowe was appointed Secretary *pro tem.* The minutes were approved as read.

The attention of the meeting was called to the shampoo liquid in Lassar's treatment for baldness, as published in the *Scientific American*, of February 15, 1890, *viz.*, Hydrarg. bichlor. corr., gr. x; Glycerini, Spir. rectif. āā, ℥ii; Aquæ destill., ℥v.

Mr. Beringer thought the amount of corrosive sublimate in this recipe was too large, and that an error had been made in translating from the French.[1]

The recipe for the embrocation in this treatment for baldness calls for acid salicyl., gr. xxx; Tinct. benzoini, ℥i; Olei ped. taur. ad ℥iii. It was thought that neatsfoot oil would not prove to be a very agreeable emollient to a bald head.

Prof. Trimble read a paper, prepared by Mr. S. J. Hinsdale, of Fayetteville, N. C., on the *Estimation of Tannin;* at the same time his assistant, Mr. Peacock, carried out the experiments according to Mr. Hinsdale's method.

Prof. Trimble said that there had been many methods proposed for estimating *tannin*, the great majority of which were failures, the best being its precipitation by gelatin in the presence of a little alum; he seemed to think that Mr.

[1] The same formulas have been published in *Provincial Medical Journal* Dec. 2, 1889, and more recently in other medical journals.—Editor AMER. JOUR. PHAR.

Hinsdale's method would be of special value in analyzing barks for tanneries. Mr. Beringer asked whether the process had been tried with other substances containing tannin ; Prof. Trimble said that it had worked equally well with two different kinds of oak bark, and with catechu ; and that different amounts of tannin had been detected by it within 0·5 per cent. of the actual quantity present.

Some discussion took place concerning parts by weight in the Pharmacopœia ; Prof. Maisch stating that it was not universally condemned in all parts of the country, some being in favor of it.

Mr. Boring stated that the advantage in the system lay in the check which was always at hand, everything being tared the weight of the percolate could be told in an instant.

Mr. McIntyre said that the greatest disadvantage lay in the fact that physicians did not prescribe in that way.

Prof. Maisch stated that some ten years ago he made known some simple rules to enable physicians to prescribe liquids by weight, as is done in Europe, but that most of the physicians had done nothing towards introducing the system.

Mr. Robert England stated that the metric system was unpopular with physicians, and that it seemed impossible to get them to use it.

Prof. Maisch stated that the reason for the use of the metric system in the formulas of the fluid extracts of the U. S. P. was on account of the intimate relationship which existed between the weights and measures, and that there was also a close relationship between the weights and measures of the British Pharmacopœia, but such was not the case with those of the U. S. Pharmacopœia.

It was suggested by Mr. McIntyre that the next meeting be held in Prof. Maisch's lecture-room, so as to give the members present an opportunity to inspect the botanical models lately imported by him from Europe.

Prof. Maisch presented a specimen of *otto of rose*, claimed to have been smuggled by sailors, and hawked about the streets of New York ; it consisted of petrolatum flavored with French oil of rose-geranium, and was evidently a fraudulent imitation made in this country.

Mr. Bullock presented to the meeting some of the so-called "*Trenton Coffee*," which consisted of very good imitations of the grains of coffee, made of clay, and flavored by being dipped in an infusion of coffee ; also some *Bismuthic acid*, and some *pentoxide of bismuth*.

Mr. Boring complained of the alcoholic strength of some of the preparations of the Pharmacopœia as being in his opinion too great, a menstruum of less strength would exhaust the drug as well, and would also promote temperance.

Mr. Robbins stated that the menstruums as ordered were intended to be the best for exhausting the drugs, and that the chief object of the Pharmacopœia was to secure uniformity in the composition of medicines.

On motion adjourned.

C. B. LOWE,
Secretary pro tem.

Inhalations of menthol, dissolved in four parts of olive oil, were observed by Dr. Jores (*Memorabilien*) to give immediate relief in severe cases of asthma. The patients inhale the atomized solution during the paroxysm.

REVIEWS AND BIBLIOGRAPHICAL NOTICES.

Hand-book of Materia Medica, Pharmacy and Therapeutics, including the physiological action of drugs, the special therapeutics of disease, official and extemporaneous pharmacy and minute directions for prescription writing. By S. O. L. Potter, M.D., Professor of the Theory and Practice of Medicine in the Cooper Medical College of San Francisco, etc. Second edition, revised and enlarged. Philadelphia, P. Blakiston, Son & Co. 1890. 8vo. Pp. 766. Price, cloth, $4; leather, $5.

The first edition of this work has been noticed at some length in this JOURNAL, April, 1887, p. 222. The author states that in the second edition all known errors have been corrected, many articles have been entirely re-written, much new matter has been incorporated and the original text has received a thorough revision. In looking over the pages and comparing the text with that of the first edition, it becomes evident that much care has been bestowed upon every part that is of special interest to the physician; but the chemical and pharmaceutical pages have not received the same attention. Most of the errors which we noticed in the first edition, to some of which we referred in the previous review, remain uncorrected, or like that relating to the sources of salicin, have been insufficiently altered. The general correctness of all that belongs to the therapeutical uses and the physiological action of medicines will render the book of as great practical value to the physician as the preceding edition has been, and the larger size of the page and the clear type will facilitate its use as a work of reference.

Spinal Concussion—surgically considered as a cause of spinal injury, and neurologically restricted to a certain symptom group, for which is suggested the designation Erichsen's Disease, as one form of the traumatic neuroses. By S. V. Clevenger, M.D., Consulting Physician in the Reese and Alexian Hospitals, etc. With 30 wood engravings. Philadelphia and London: F. A. Davis, publisher, 1890. 8vo. Pp. 338. Price, $2.50.

Physicians and lawyers will recognize this work as one of especial importance to their respective professions, it treating of a subject which for more than twenty years has occasioned bitter contention in law-courts, and the voluminous literature of which has been carefully reviewed by the author and supplemented by his own observations.

The Chapters are: Historical Introduction; Erichsen on Spinal Concussion; Page on Injuries of the Spine and Spinal Cord; Recent Discussions of Spinal Concussion; Oppenheim on Traumatic Neuroses; Illustrative Cases of Spinal Disease; Traumatic Insanity; The Spinal Column; Symptoms; Diagnosis; Electro-diagnosis; Differential Diagnosis; Pathology; Treatment; Medico-legal Considerations. Some of the special features consist in a description of modern methods of diagnosis by electricity, a discussion of the controversy concerning hysteria, and the author's original pathological view that the lesion is one involving the spinal sympathetic nervous system. In this latter respect entirely new ground is taken, and the diversity of opinion concerning the functional and organic nature of the disease is afforded a basis for reconciliation.

The following *Proceedings of State Pharmaceutical Associations* have been received:

Alabama.—Eighth Annual Meeting. Pp. 31. See last volume, p. 376.

Massachusetts.—Eighth Annual Meeting. Pp. 145. See last volume, p. 537.

North Carolina—Tenth Annual Meeting Pp. 59. See last volume, p. 538.

A Popular Treatise on the Extent and Character of Food Adulterations. By Alex. J. Wedderburn, special agent. Washington. 1890. Pp. 61.

This is Bulletin No. 25, Division of Chemistry, published by authority of the Secretary of Agriculture.

Expe ental Farms. Reports for 1888. Ottawa, 1889. Pp. 142.

A report made to the Minister of Agriculture for Canada by the Director, Prof. Wm. Saunders, and including the reports of the Chemist, Entomologist, Botanist and other officers.

Fourth Annual Report of the Massachusetts Board of Pharmacy, for the year 1889. Boston. Pp. 7.

During the past year the Board examined 276 candidates, of which number 141 were rejected.

Séance Solennelle de Rentrée et Distribution des Prix de l'École Supérieure de Pharmacie de Paris, le 9 Novembre, 1889. Pp. 19.

Commencement and distribution of prizes at the Paris Superior School of Pharmacy.

Proceedings and Papers of the State Sanitary Convention, held at Lewisburg, Union County, Pa. 8vo. Pp. 120.

Proceedings of the National Conference of State Boards of Health, held at Cincinnati, O., May 4, 1888. Harrisburg. 1889. Pp. 53.

Do the Sanitary Interests of the United States demand the annexation of Cuba? By Benjamin Lee, A.M., M.D., etc. Pp. 8.

The last pamphlet is a reprint from the transactions of the American Public Health Association. For it and the two preceding pamphlets we are indebted to Dr. Benj. Lee, the Secretary of the Pennsylvania State Board of Health.

Diálisis Química. Aplicaciones del Sulfato de Cal. Por Alfonso L. Herrera, Alumno de la Escuela Nacional de Medicina. Mexico. 1889. Pp. 37.

Chemical Dialysis. Applications of Calcium Sulphate.

The author has made a study of the process of dialysis and of the application of various chemicals, having much affinity for water, for the concentration of liquids without evaporation. For the latter purpose anhydrous sulphate of calcium was found to be well adapted. After the requisite quantity of plaster Paris has been added, the mixture is well agitated for fifteen or twenty minutes, when the hydrated salt is deposited as a crystalline powder, from which most of the liquid can be readily poured off, the small quantity retained by the powder being recovered by forcible expression or by centrifugal force. A little calcium sulphate remaining dissolved in the aqueous filtrate, is either precipitated by alcohol, or the calcium is removed by sodium carbonate. The author makes also suggestions for the use of this method in the preparation of various organic compounds, of galenical preparations, and in analytical investigations.

Vergleichende Microscopisch-Pharmacognostische Untersuchungen einiger Officinellen Blätter mit Berücksichtigung ihrer Verwechselungen und Verfälschungen. Von Bruno Jürgens. Dorpat. 1889. Pp. 62.

Comparative Microscopic-Pharmacognostic Examinations of some officinal leaves with regard to their adulterations.

An inaugural dissertation on a subject of much interest and importance. The results cannot be sufficiently condensed for a brief review.

We take pleasure in acknowledging the receipt of a number of reprints from various journals of valuable papers by Messrs. Bertram & Gildemeister, Mr. H. Bonnewyn, Dr. J. E. De Vrij, Dr. O. Hesse and Mr. Ludwig Reuter.

The Agricultural Grasses and Forage Plants of the United States, and such foreign kinds as have been introduced. By Dr. Geo. Vasey, Botanist. With an appendix on the chemical composition of grasses, by Clifford Richardson, and a glossary of terms used in describing grasses. A new, revised and enlarged edition, with 114 plates, published by authority of the Secretary of Agriculture. Washington: 1889. 8vo. Pp. 148.

A very interesting publication by the Department of Agriculture, valuable alike to the agriculturist and to the botanist, containing, in addition to the plates, descriptions of the plants, and an account of their distribution, culture, value as fodder, etc. The portion written by Mr. Richardson gives, in tabular form, the results of 136 analyses of different grasses, calculated for the dry substance and also for the fresh substance or for hay, with an average amount of water equalling 14·30 per cent.

Bericht der Wetteravischen Gesellschaft für die gesammte Naturkunde zu Hanau, 1887–1889, erstattet von dem Direktor derselben Fr. Becker, Realschul-Direktor. Hanau. 1889. Pp. 110.

Report of the Wetteravian Society for the Natural Sciences.

Among the scientific papers are essays on butterflies, plants, diamond, fossil shells of the genus Acme, acoustic researches and geological investigations.

OBITUARY.

William J. McConn, Ph.G., class 1884, died of consumption at Trenton, N. J., where he was in business, December 17, 1889. He was born in Philadelphia, August 13, 1864.

Walter T. Baker, Ph.G., class 1876, died of pneumonia January 14, 1890, aged 45 years: he was in business at Nineteenth and Oxford Streets, Philadelphia.

Benedict Nicholas Rapp, Ph.G., class 1883, of Trenton, N. J., conducted a pharmacy at Twenty-eighth and Poplar Streets, Philadelphia, where he died January 25th.

Cornelius W. Stryker, Ph.G., class 1882, was a member of the firm of Stryker & Ogden, who succeeded Prof. Remington in business; he died in this city, February 10th, aged 30 years.

William P. Burnett, a senior student of the class 1889–90, died in Camden, N. J., February 20th, aged 20 years.

Edgar H. Naudain, Ph.G., class 1885, was born in Chester County, Pa., June 3, 1865, and died of consumption near Middletown, Del., August 2, 1889. He learned the drug business in Wilmington, Del., and studied at the Philadelphia College of Pharmacy, presenting a graduation thesis on Pinckneya pubens, an abstract of which was published in this journal 1885, p. 161. Afterward he conducted a pharmacy in Philadelphia at the corner of Fifth and Poplar streets, until failing health compelled him to relinquish business.

THE AMERICAN
JOURNAL OF PHARMACY.

APRIL, 1890.

ON VILLOSIN AND VILLOSIC ACID.

By G. A. Krauss, Ph. G.

From a letter addressed to the Editor; read at the Pharmaceutical Meeting, March 18.

Since my departure from college I have found sufficient time to further experiment on the principle to which I designed the name *Villosin*.[1] This glucoside, as I will later on plainly prove, is very easily decomposed into glucose and villosic acid. Indeed a prolonged boiling of its solution in 50 per cent. alcohol decomposes villosin gradually as the alcohol evaporates. That this decreases the amount of villosin obtainable is well understood.

Recalling the process of its preparation, the bark is exhausted with alcohol, sp. gr. 0·820; this tincture is macerated with freshly precipitated ferric hydrate until all tannin has been removed; the whole is then filtered and expressed. The colorless liquid is evaporated to expel all the alcohol, as a trace of it remaining will cause a failure in obtaining crystals. After having filtered off the resin, the cool and clear aqueous solution is agitated with ether, sp. gr. 0·725. Nearly all the villosin will have separated in 3–5 days in long needle-shaped crystals.

On account of its instability, I only obtained about 18 grains of villosin from 3 lbs. of blackberry root bark, the greater part being decomposed during the evaporation of the alcoholic filtrate and filtered off as a white resin acid, which is bitter, and soluble in alcohol, ether and chloroform. This *villosic acid*, dissolved in ether, and the solution evaporated spontaneously, is obtained crystalline. It shows the same color reactions as villosin viz: (1) Treated with

[1] See American Journal of Pharmacy, 1889, p. 605.

concentrated H_2SO_4 + 2 drops HNO_3, a deep blood red color appears, which fades in not less than 8 hours, but disappears entirely on the addition of water, with the formation of a precipitate. (2) Treated with concentrated H_2SO_4 and 2 drops H_2O, aided with a little heat, a blue color appears, similar to the one obtained by strychnine with H_2SO_4 + $K_2Cr_2O_7$.

To obtain crystallized villosin, I endeavored to improve my previous method, but have not as yet succeeded. A weaker menstruum than alcohol, sp. gr. 0·820, is objectionable as the extraction is not fully accomplished. The lime method is also to be abandoned. Although the exhaustion may have been perfect enough, the lime appears to decompose the villosin. The latter is precipitated largely as villosic acid, on treating the last filtrate with HCl.

Now regarding the glucoside itself I have already shown its nature and behavior to reagents, and although there is no doubt to its being a glucoside, I wish to mention a few observations. But before so doing I feel obliged to correct the statement, made in my thesis, that the glucoside itself reduces Fehling's solution. This is an error. When perfectly pure, villosin does *not* reduce Fehling, but it does it very distinctly after having been boiled with dilute HCl.

You are aware that the washing of the ferric hydrate, in order to remove $(NH_4)_2 SO_4$ appears to be an essential part in the process, the $Fe_2 (OH)_6$ being employed to precipitate the tannin. It is difficult to obtain the hydrate perfectly pure. I have always found indications of $(NH_4)_2 SO_4$ in that part of the solution, which was ready to be treated with ether. However, it did *not* interfere with the process.

This last-named solution contains a large amount of glucose, which, according to my dissertation, could not have existed as such in the original alcoholic extract. It again shows the large amount of decomposed glucoside, and through the presence of some of this glucose, the error was made that villosin reduces Fehling. Enclosed you will find a sample of villosin, about 4 grains being the entire product of 3 pounds of bark, and also the decomposition product which separated out during its preparation.

According to this, villosin would only be present in the bark to the amount of 0·019 per cent., and not 0·8 per cent. as was stated in my thesis. Whether I had been working at that time with a

better quality of bark, or whether some other cause must be assigned for the difference, I am at present unable to say. A method for the quantitative estimation of this glucoside has not as yet been devised.

Further experiments and its ultimate analysis I beg to reserve for future investigations.

Memphis, Tenn.

MORPHINE SALTS AND HYDROCYANIC ACID.

By John M. Maisch.

Read at the Pharmaceutical Meeting, March 18, 1890.

During the last six or eight months the following item has appeared in quite a number of medical journals:

One of the most dangerous incompatibilities of drugs consists in a mixture of cherry-laurel water with morphine. In such a combination an insoluble cyanide of morphine is formed, which is precipitated. If no attention be paid to this effect, it may happen that the patient takes with the last portions of the mixture a toxic dose of morphine and hydrocyanic acid. As cherry-laurel water is recommended to preserve alkaloidal solutions from microscopical vegetations which decompose them, this observation is worth noting, not only for morphine, but also for the other alkaloids. The addition of five or six drops of hydrochloric acid will prevent the formation of cyanide of morphine; but if for certain purposes this addition be useful, it is not to be employed in the case of solutions intended for hypodermic injections.

In a paper, published in the American Journal of Pharmacy, June, 1871, p. 258, I stated that hydrocyanic acid does *not* precipitate neutral solutions of morphine. The same paper details some experiments made by me with neutral salts of morphine and alkali cyanides which were shown to precipitate the morphine so completely that the filtrate will yield no further precipitate with potassio-mercuric iodide. The crystalline precipitate I supposed to consist of morphine hydrocyanide, but Prof. Flückiger subsequently showed (*N. Jahrb. für Pharm.*, xxxviii, p. 138) that under the conditions mentioned, the alkaloid morphine is precipitated, and that a morphine cyanide does not exist.

The error in the above statement can only be explained by the improper preparation of the cherry-laurel water used. If made by dis-

tillation from the leaves it cannot contain a cyanide, and the free hydrocyanic acid will not cause a precipitate. Very likely the water was prepared by means of magnesia, in which case it must have contained magnesium cyanide which would precipitate morphine.

It is proper to add that, in the paper quoted, Prof. Flückiger has also shown that berberine, quinine, cinchonine and strychnine likewise do not form cyanides under similar circumstances.

TARTARIC ACID.

By Fred. H. Smith.

Contribution from the Chemical Laboratory of the Philadelphia College of Pharmacy.—No. 69.

Read before the Philadelphia College of Pharmacy at the Pharmaceutical Meeting, March 18.

It has been noticed that the text books differ in their statements about the melting point of tartaric acid. Many give 135° C., which was obtained by Schiff in 1863 (*Annalen der Chemie*, CXXV, p. 133). In a number of the works published since that time, the melting point is given as 170° C., notably in Watt's Dictionary (vol. 5, p. 675), which gives 170° to 180° C. as the temperature at which the acid melts. My observations have differed from all of them, and in order to obtain more light upon the subject, I purchased seven samples of the acid from different retail stores, six of which were in the form of powder, the other in crystals.

The melting points were taken and resulted as follows:

	A	B	C	D	E	F	G Crystals.
Melting Point, .	162.8°	163·5°	159·1°	163·5°	163·5°	167·5°	162

These experiments were performed with a corrected Yale thermometer.

It was thought that possibly the variation in the melting points might in some respect be due to adhering moisture. Consequently a number of the samples were dried at a temperature between 80 and 90° C. for about an hour, the amount of loss, however, was not over ·005 to nearly 5 gms. of the acid. After drying, the melting points were again determined, but did not vary perceptibly from the

first determinations. One of the samples was recrystallized, both from water and alcohol, and then carefully dried, but no change in the melting points was noticed.

The Pharmacopœia states that on ignition not more than 0·05 per cent. of ash should remain. About 10 gms. of each sample was incinerated in a porcelain capsule, and the amount of ash calculated, and resulted as follows:

	A	B	C	D	E	F	G Crystals.
Per cent. of ash, .	0·04	0·12	0·111	0·04	0·02	0·12	0·04

The ash left was examined and found to consist almost entirely of calcium sulphate without evidence of copper or other metallic salts.

Ten cc. of a concentrated solution showed on standing but a slight cloudiness with barium chloride and hydrochloric acid in excess; this cloudiness almost entirely disappeared on boiling showing the presence of but the slightest trace of sulphuric acid.

Concentrated solutions of the acids were poured into a solution of calcium hydrate, the alkaline reaction allowed to predominate; a white flocculent precipitate was formed, which was entirely soluble in ammonium chloride, and acetic acid, the former showing distinction from racemic acid, and the latter distinction from oxalic acid. In all other respects the samples agreed with the tests for dextro-tartaric acid.

Allen (Vol. I, 2d edition, p. 435) states that a 15 per cent. aqueous solution rotates the plane of polarization 13·1° to the right; temperature 15° C. This experiment was tried with a number of the samples, but the polarization indicated only 2·10° to the right at a temperature of 15° C.

These results indicate that the above quoted authorities are wrong so far as the acid of commerce is concerned, and the subject is one worthy of further investigation.

Antipyrine and Thalline.—Dr. Moncorvo (*Jour. de Méd. de Paris*) regards both compounds as possessing valuable hæmostatic properties, probably acting both by constricting the vessels and coagulating the blood. *Acetanilid* and *Phenacetin* do not possess much hæmostatic power.

A COMPARATIVE EXAMINATION OF KRAMERIA TRIANDRA AND KRAMERIA ARGENTEA.

By R. G. Dunwody.

Contribution from the Chemical Laboratory of the Philadelphia College of Pharmacy.—No. 70.

Read before the Philadelphia College of Pharmacy at the Pharmaceutical Meeting, March 18.

Krameria argentea is largely sold in the market at the present time, and in order to determine its value, compared with Krameria triandra, I estimated the tannin in reliable samples of the two.

An infusion was made of each of the drugs containing 10 grams in 250 cc. A portion of each of them was precipitated with a solution of gelatin and alum, and the precipitate dried between the temperature of 100 and 110° C., then weighed; the Krameria triandra yielded 8·4 per cent., while the Krameria argentea yielded 7·2 per cent. These estimations were repeated with similar results.

In order to determine the constituents of the two drugs, fifty grams of each were subjected to the usual plant solvents, with the following results:

	Krameria triandra.		Krameria argentea	
Petroleum Ether,	·40	0·40	·240	·240
Ether, soluble in water,	·53		3·986	
Ether, soluble in alcohol,	3·09		·024	
Ether, Total,		3·62		4·010
Absolute Alcohol, soluble in water,	5·531		3·04	
Absolute Alcohol, insoluble in water,	17·485		9·60	
Absolute Alcohol, Total,		23·016		12.64
Distilled Water, Tannin,	1·360		1·570	
Distilled Water, Extractive,	·368		·368	
Distilled Water, Total,		1·728		1·938
Alkaline Extract, Pectin,	1·320		1·500	
Alkaline Extract, Extractive,	5·490		7·420	
Alkaline Extract, Total,		6·810		8·920
Acid Extract, Pararabin,	·160		·810	
Acid Extract, Extractive,	1·731		·018	
Acid Extract, Total,		1·891		·828
Boiling Water, Starch,	·559		·520	
Boiling Water, Extractive,	2·637		1·280	
Boiling Water, Total,		3·196		1·800
Moisture,	11·256	11·256	11·947	11·947
Ash,	2·445	2·445	2·785	2·785
Residue Cellulose and Lignin,	44·345	44·345	53·118	53·118
Loss,	1·293	1·293	1·774	1·774
	100·000	100·000	100·000	100·000

The portions that were dissolved by petroleum ether left, after spontaneous evaporation, a crystalline fat. This was treated with absolute alcohol, then the melting points of both were taken; the fats melted at 40° C.

After treating the alcoholic extract with water, it was shaken with ether, then separated and put in a vacuum flask and evaporated to dryness, the residue taken up with water and again shaken with ether; this process was repeated several times to purify the tannin. The tannins, with gallotannic acid, were treated with the following reagents:

	Gallotannin.	Tannin of Kr. triandra.	Tannin of Kr. argentea.
Ferric chloride, ...	deep blue precipitate,	olive green precipitate,	olive green precipitate.
Ferrous sulphate, . . .	no change,	no change,	no change.
Ferric acetate, ...	bluish-black precipitate,	bluish-green precipitate,	olive precipitate.
Lead acetate, ...	flesh-color precipitate,	flesh-color precipitate,	flesh-color precipitate.
Ammonium hydrate and Iodine solution, . .	red color,	red color,	red color.
Ferricyanide Potass. and Ammonium hydrate, .	red color,	red color,	red color.
Fehling's solution, . .	reduced,	reduced,	reduced.

From these experiments, it is concluded that the Krameria argentea, as found in this market, is a little lower in tannin strength, as well as in the other constituents, when compared with the true rhatany.

The properties of the constituents in the two drugs appear to be the same.

TINCTURE OF MUSK.

By Geo. M. Beringer, Ph.G.

Read before the Philadelphia College of Pharmacy at the Pharmaceutical Meeting, March 18.

The U. S. Pharmacopœia directs that Tincture of Musk should be made of 10 parts of grain musk extracted with dilute alcohol to yield 100 parts of tincture.

The officinal musk is pure grain musk, which in recent years has ranged in price from $20 to $35 per oz., making a tincture prepared by this process cost from $30 to $50 per pint. The U. S. Dis-

pensatory clinches the officinal requirements by the statement that "care should be especially taken to use pure grain musk in this preparation."

It is charged that the amount of menstruum used is not sufficient to exhaust the musk, and the process is consequently extravagant and wasteful of this most expensive drug.

The following simple experiments proved this statement: 1 gm. of musk, treated by the officinal process, yielded 20 per cent. of extractive. The residue, again treated with the same amount of menstruum, yielded quite a strong tincture, containing over 6 per cent. of extractive, and a third maceration yielded a tincture still containing a considerable amount of odorous matter.

The German Pharmacopœia is content with a tincture of musk, containing two per cent. of musk and extracted with a somewhat weaker alcoholic menstruum. One grm. of musk extracted by this process yielded 30 per cent. of extractive and a second maceration, with 10 cc. diluted alcohol, yielded 2 per cent.

I doubt if any amount of menstruum that could be ordered in an officinal formula would entirely exhaust the musk. The perfumer who makes his tincture with strong alcohol, is well aware of this fact and always macerates the residue from his tincture with fresh alcohol, frequently saving the dregs for remaceration a number of times.

I would suggest that in the pharmacopœial revision a strength of eight grains to the fluid ounce, with diluted alcohol as a menstruum, be adopted, which yields a tincture nearly identical in strength with that of the German Pharmacopœia.

PHÉNOL SODIQUE.

By George M. Beringer, Ph.G.

Read before the Philadelphia College of Pharmacy at the Pharmaceutical Meeting, March 18.

A brother pharmacist recently called my attention to the fact, that the National Formulary published under this title the following formula:

Carbolic acid, crystallized,	30 parts.
Soda,	2 "
Water,	28 "

Dissolve the soda in the water, add the carbolic acid and warm gently until it is dissolved.

This formula is based upon that for Liquor Natri Carbolici, formerly officinal in the German Pharmacopœia, and yields a preparation containing 50 per cent. of crystallized carbolic acid, and having no resemblance to the proprietary article sold under the same name in such large quantities, and not infrequently an ingredient in prescriptions, at least in this locality.

This proprietary article, originating in France, and also made by a manufacturing house in Philadelphia, is largely used as a disinfectant and as an antiseptic applied to wounds and cuts, as a gargle, tooth wash, in dentistry and in injections, and the substitution of the preparation of the National Formulary, where the proprietary was intended, would prove a serious error.

The formula of the German Pharmacopœia has been copied into the various standard works, such as the U. S. and National Dispensatories and Hager's Pharmaceutische Praxis. The only other formula which my search revealed was in The Extra Pharmacopœia, of Martindale and Westcott, where the following statement occurs: "Carbolic acid is freely soluble in caustic alkaline solutions, and a French specialty, known as Phénol Sodique, is much used as an antiseptic solution by dentists. Its composition is about as follows: Liquor Sodii Carbolatis, : phenol, 8; caustic soda, 4; distilled water, 100."

This formula also yields a preparation much stronger than the proprietary article. A sample of the latter, made in this city, showed the following characteristics: A thin, dark colored, almost black, liquid, sp. gr. 1·015, an alkaline reaction. On agitating, a great quantity of foam is produced. It contains 66 per cent. of tarry matters and about one per cent. of phenols, which are not separated in diluting with water, and nearly 1·5 per cent. of soda.

The following formula yielded a preparation very similar:

Take of coal tar, ... 2 troy ounces.
Soda, ... 120 grains.
Water, sufficient to make one pint.

Dissolve the soda in 4 fluid ounces of water and warm, add the coal tar and thoroughly agitate the mixture for a few minutes. Then add the remainder of the water and set aside in a covered vessel in a warm place, frequently agitating for 7 days. Decant the

aqueous solution, and filter through a moistened filter, washing the residue with sufficient water to make the finished product measure one pint.[1]

PHARMACEUTICAL NOTES.

Abstracts from Theses.

Liquor Ferri Chloridi.—A specimen prepared by Rob. W. Maris, Ph.G., had the specific gravity 1·435, contained a trace of nitric acid, and on evaporation 10 gm. yielded a solid residue of 1·98 gm. Five commercial specimens contained also a little nitric acid (with the exception of one specimen) and gave the following results:

Specific gravity, ...	1·392	1·421	1·414	1·417	1·406
Solid residue from 10 gm., .	1·79	1·90	1·89	1·91	1·88

For the Preparation of Antiseptic Ligatures, Edward Q. Thornton, Ph.G., uses cat-gut (E and A violin strings being most frequently used) which is wrapped loosely upon glass spools and then kept in ether for 24 hours. Remove the spools from the ether, pass a glass rod through them, and allow the ether to evaporate avoiding contact with anything. When dry cover with a one per cent. solution of mercuric chloride in diluted alcohol; after half an hour remove from the mercuric solution, and wipe the cat-gut with a towel that had previously been washed out of a 0·1 per cent. solution of mercuric chloride in water. The cat-gut is preserved in a bottle under oil of juniper, and should remain in the oil for at least ten days before it is used. (See also American Journal of Pharmacy, 1886, p. 598.)

Preservation of Yolk of Egg.—Cyrill D. Rosenkrans, Ph.G., recommends the preservation of the yolk by carefully drying it upon glass plates, and keeping it in thin layers in paper boxes lined with paraffined paper. After several months it showed no tendency to rancidity or decomposition. Using this dried yolk for an emulsion, it is rubbed up in a mortar with a small quantity of sugar, then sufficient water is added to make a smooth paste, after which the oil and remaining water are incorporated with it in the usual manner.

[1] Note by the Editor.—The French Codex gives a formula for *Phénol sodé dissous*, which consists of phenol, 70 gm.; caustic soda solution (spec. grav. 1·332), 100 gm.; distilled water sufficient to make one liter. The soda solution contains nearly 23 gm. of Na_2O corresponding to 29 gm. of NaHO.

Purification and Preservation of Lard.—James L. Demoville, Ph.G., finds the alum process for purifying lard all that can be desired. The lard is melted, a little powdered alum being stirred in; then strained, cooled, and upon an inclined slab rubbed briskly with a muller, while a stream of water is allowed to trickle over it.

For preserving the lard experiments were made, besides with benzoin, with balm of Gilead buds, storax, salicylic acid, turpentine and tolu. The best results were obtained by using one per cent. of balsam of tolu; the lard was white, kept well and had its peculiar odor well masked by the slight but pleasant odor of the balsam.

Fluid Extract of Wild Cherry.—After making a number of experiments with this fluid extract, Michael J. Rourke, Ph.G., recommends the following process as yielding an elegant preparation: Moisten wild cherry bark in No. 50 powder, 200 gm., with a mixture of glycerin 20 gm., syrup 60 gm. and diluted alcohol 40 gm.; pack loosely in a glass percolator and set aside for three days. Now, pack very tightly and pour enough diluted alcohol upon the material, to thoroughly saturate the powder and leave a stratum above; again macerate for three days, and then allow percolation to proceed until 200 ccm. of liquid have been obtained. By proceeding as indicated the virtues of the drug are exhausted, and the percolate obtained afterwards merely contains a little coloring matter and a very small quantity of bitter principle.

Fluid Extract of Guarana.—In the experience of Rob. P. Blackburn, Ph.G., this fluid extract, as made by the process of the U. S. Pharmacopœia, deposits a rather large precipitate within a few months. The amount of precipitate is materially decreased by using a menstruum composed of alcohol and water in the proportion of 4 to 1 measure, with sufficient glycerin added so that 2 oz. of it will be contained in a pint of the fluid extract.

Quebracho Preparations.—Leon S. Risley, Ph.G., suggests several galenical preparations of quebracho bark, viz:

Extractum Quebracho fluidum.—Quebracho bark in No. 30 powder 16 oz.; alcohol 9 fl. oz.; water 5 fl. oz., and glycerin 2 fl. oz. Proceed by the pharmacopœial process for similar preparations.

Elixir Quebracho.—Fluid extract of quebracho, 1 fl. oz.; magnesium carbonate, 2 drachms; mix thoroughly, then add aromatic spirit (Nat. Formulary), 180 minims, tincture of vanilla 120 minims, syrup 1 fl. oz., and aromatic elixir sufficient for 1 pint.

Extractum Quebracho.—The bark is exhausted with a mixture of alcohol 9 and water 5 parts, the tincture is evaporated, and glycerin 5 per cent. incorporated with the extract.

PRACTICAL NOTES FROM VARIOUS SOURCES.

By the Editor.

Calcium hippurate, which crystallizes in oblique rhombic prisms, and is soluble in 18 parts of cold water, has been employed in uric diathesis, in scrofula and in hepatic cirrhosis; it may be prepared extemporaneously, and for this purpose is ordered by Dujardin-Beaumetz as follows: Hippuric acid, 1; lime water, 35, and syrup, 35 parts. Dose: A tablespoonful.

Glycerite of Salicylic Acid.—M. H. Barnouvin states that on dissolving 1 gm. of salicylic acid in 50 gm. of warm glycerin, on cooling, the liquid will remain clear, but on diluting it with 10 gm. fo water, a precipitate of salicylic acid will be immediately produced. However a solution of 1 part of acid in 100 parts of glycerin may be diluted with water in all proportions.—*Bull. Gén. de Thérap.* 1889. Nov. 30.

Prophylactic Mouth-wash.—Two formulas are given by Dr. Monte in *Deutsche Med. Wochensch.*, 1889. Borated mouth-wash consists of boric acid, 2·5; distilled water, 250, and tincture of myrrh, 3 parts. The salicylated wash is made with sodium salicylate, 3; dist. water, 250, and tinct. myrrh, 3 parts.

Dentifrice for whitening the teeth is recommended by Gawalowski to be made of powd. sepia or prepared chalk, made into a stiff paste with hydrogen peroxide.

Toothache Paste.—A resinous acid, 1·0; cocaine hydrochloride, 1·0; menthol, 0·2 gm., glycerin sufficient.—*Rev. de Thérap.*, 1889.

Administration of Iodoform.—Dr. Besner orders for scrofulous children iodoform, 0·1, in clarified honey, 100–150 gm. Dose: A teaspoonful 3 times a day.—*Rev. Gén. de Clin.*, 1889.

Administration of butylchloral in neuralgia is recommended by Liebreich as follows: Butylchloral, 3–5; alcohol, 10; glycerin, 20; distilled water, 120 gm. Dose: A tablespoonful.

Salol dusting-powder, composed of salol, 1, and starch, 8 parts, has done excellent services to Dr. Kiezer (*Prov. Med. Jour.*) in cases of wounds, burns, ulcers, defects of the skin, etc.

Sozoiodol dusting-powder, composed of sozoiodol, 10, and powdered starch or talc, 90 parts, is recommended by Dr. Ostermayer (*Deutsche Mediz. Wochensch.*) in burns caused by direct flame, hot steam or chemicals, like caustic alkalies. The powder is odorless, not poisonous, allays pains and prevents suppuration.

Catarrh Snuffs.—The *Jour. de Méd. de Paris* gives the following in chronic coryza: Alum, 2; borax, 2; zinc tannate, 3; bismuth tannate, 3; lycopodium, 8; menthol, 0·2 gm.

In scrofulous complications, the snuff is prepared of zinc sulphophenate, 0·2; zinc tannate, 2; iodol, 3; bismuth salicylate, 4, and powdered tobacco, 10 gm.

Another formula directs naphthalin, 25; boric acid, 25, and camphor, 1 part.

Ammonium carbonate, given in frequently repeated and rather large doses, is stated by Dr. B. Robinson to be one of the best agents for aborting a coryza.

Suppositories of chloral are recommended by Yvon to be combined with belladonna to prevent irritation, as follows: Chloral hydrate, 0·5; extr. belladonna, 0·3; cacao butter, 3·0 gm.—*Rev. de Clinique.*

Quinine and Antipyrine.—Greuel (*Apoth. Ztng.*, 1889, p. 1365) again draws attention to the fact that quinine is rendered more soluble by the addition of antipyrine. He states further that such a solution does not give the thalleioquin reaction, but yields a flesh-colored precipitate, which crystallizes from alcohol in needles. This indicates that a chemical reaction has taken place between the two compounds, but the product has not as yet been studied.

Carbolic Acid and Bromine.—Sehrwald (*Rundschau*, Prag) found in carbolic acid an agent for counteracting the effects of bromine. Inhalations of phenol are stated to allay the pain resulting from the inhaling of bromine vapors. A 2 per cent. solution of phenol is beneficial in treating bromine burns on the skin.

Caoutchouc plasters are prepared by Dr. Schneegans and M. Corneille (*Jour. d. Phar. v. Elsass-Lothr.*, Feb., 1890, p. 33,) from a mass consisting of lanolin, benzoinated tallow, caoutchouc and dammar resin, the last two ingredients being employed merely in sufficient quantity to insure adhesiveness. The addition of a little glycerin prevents the plaster from becoming dry and brittle. Sheet caoutchouc is agitated with and macerated in 5 times its weight of benzol; at first it swells and in about 3 or 4 days it dissolves.

Plaster of Zinc oxide, (20 per cent.)—Dammar, 15; tallow, 25; lanolin, 15; caoutchouc, 5; glycerin, 20; zinc oxide, 20 parts. Melt the resin, add the tallow and strain through gauze; then add the lanolin and the caoutchouc solution, cautiously evaporate the benzol and add the zinc oxide previously rubbed up with the glycerin; lastly stir until a homogeneous mixture is obtained. On spreading it upon muslin, the mass should not be too warm. One kilo of mass will suffice for 25 to 30 meters of plaster 20 cm. in width, and this may be spread in 1 or 1½ hours. The plaster is finally exposed to the air for 2 or 3 days, covered with gauze and preserved in paper.

Plaster of Iodoform.—Dammar, 15; tallow, 30; lanolin, 20; caoutchouc, 5; glycerin, 10; iodoform, 20 parts. Proceed as before, and add the iodoform, well triturated with the glycerin, to the nearly cooled mass. Keep the plaster in a tin box.

Plaster of Mercury.—Dammar, 20; tallow, 34; lanolin, 20; caoutchouc, 6; mercury, 20 parts. Rub the mercury with the lanolin until no globules remain visible and add this to the nearly cool mixture of the other ingredients, prepared as stated above.

CHEMICAL NOTES.

By Henry C. C. Maisch, Ph.G., Ph.D.

Sugar reagent.—Matthieu-Plessy (*Monit. Scientif.*, 1889, 1446) gives the following reagent for cane-sugar, grape-sugar, and pyrogallic acid: 54 pts. of ammonium nitrate are fused, and 34 pts. lead nitrate and 21 pts. of plumbic hydrate are added. The reagent melts at 105° C., and with the substances named gives mixtures, having in the presence of glucose a cherry red, with cane-sugar a coffee colored, and with pyrogallic acid a chrome-green color.

Mussænda coffee.—Prof. Dunstan (*Pharm. Journ and Trans.*, Nov. 16, 1889, 381) analyzed the above and could not find a trace of the 0·3–0·5 per cent. coffeine which was said to be contained in these seeds, supposed by Lapeyrère (1888) to be derived from *Mussænda borbonica*, a new species of Rubiaceæ. Dunstan found no alkaloid (doubtful traces of choline excepted); but ascertained the presence of much protein, little sugar, and of a fat resembling that of nux vomica. According to investigations carried on in the Kew Gardens, the seeds, which Lapeyrère commended as a substitute for coffee, come from *Gærtnera vaginata*, a loganiaceous shrub.

Belladonnine.—E. Dürkopf (Berichte, 1889, 3183) states that commercial belladonnine is the evaporated mother-liquor from atropine, after digesting its acid solution with ether and chloroform to extract the hydrocarbons, etc., the remaining atropine may be split into tropine and tropic acid, while hyoscine (about 18 to 20 pr. ct.) remains in the solution and the so-called belladonnine remains intact. Hyoscine gives a gold salt melting at 200° C. This explains the presence of pseudatropine among the decomposition products of crude belladonnine which will be further investigated by the author.

Ophioxylin.—Wefers-Bettink (*Rec. trav. chim. de Pays-bas*, VIII, 319–322) isolated from the root of *Ophioxylon serpentinum*, an apocynaceous plant, used in East India as a purge and anthelmintic, by extraction with chloroform a yellow crystalline principle, which he named ophioxylin. By means of crystallization from hot water and several times from alcohol it was obtained in needles melting at 72° C., and showing the composition $C_{16}H_{12}O_6$. It is difficultly soluble in water, but easily soluble in chloroform, benzol, carbon bisulphide and glacial acetic acid. The solution colors the skin first yellow and then brown. On careful heating ophioxylin sublimes. The yield is about 0·2 per cent. The principle somewhat resembles juglone.

Alkaloids of Stylophorum diphyllum and Chelidonium majus.—F. Selle (*Zeitschr. f. Naturw., Halle*, p. 269–320) finds stylophorine identical with chelidonine (see E. Schmidt A. J. P., 1890, p. 12.) Besides this he isolated another alkaloid, crystallizing in needles, having the melting point 193–195° C., and giving the following color reactions; with Fröhde's reagent, (sulphomolybdate) yellow, green, blue-green, dark-blue, blue-green; with Erdmann's reagent (H_2SO_4 + trace of HNO_3) yellow, bright-green, becoming blue from the circumference, the liquid soon however assuming a dirty green color; with Mandolin's reagent (sulphovanadate), green, blue-green, bright-blue (lasting a long time), then dark blue-green. A body similar to chelerythrine or sanguinarine was recognized by the fluorescence of the ethereal solution of the free base and the red color of its salts. This alkaloid shows the following reactions: with concentrated sulphuric acid first yellow, then greenish and lastly red-brown; with corrosive sublimate an orange-colored precipitate. The author's results of the analysis of the root of Chelidonium

majus are in the main the same as those obtained by E. Schmidt (l. c.).

Action of Acids on Litmus.—According to J. E. Marsh (*Chem. News*, lxiv, p. 2) water must be present to obtain the common reaction for acids. Dry blue litmus paper is not reddened in perfectly dry hydrochloric acid gas, concentrated or fuming sulphuric acid or glacial acetic acid. Only nitric acid is an exception, as nitration of the organic material takes place under liberation of water, thus giving rise to the color.

On Synthetical Carbolic Acid.—A. Schneider (*Pharm. Centralh.*, 1890, p. 68) compared the ordinary and the synthetical carbolic acid in regard to the action of different substances probably causing the red coloration. Samples of the two acids were allowed to stand for three months with cork, wood, zinc, tin, iron and lead, the synthetic acid had turned slightly yellow, while the coal tar carbolic acid had assumed a more reddish-yellow color. Samples of synthetic acid, which were in contact with copper, assumed a bright red color in a few days, which remained constant during the time of the experiment. The acid from coal tar, similarly treated, also turned red and soon became a brown-colored liquid. In a mixture of ammonia and alcohol, the synthetic acid assumes the same blue color as the coal tar acid, although slower.

On Echugin.—R. Böhm (*Centralb. f. d. med. Wissensch.*, 1889, p. 892) analyzed the echugin poison, which is a blackish-brown, crummy, odorless and intensely bitter mass, obtained from *Adenium Bœhmianum*, Apocynaceæ, indigenous to the German possessions in southwest Africa. The author isolated a crystalline glucoside echugin, and a resinous body, echugon. The glucoside crystallizes in small, colorless, satiny, rhombic plates, easily soluble in water and alcohol and insoluble in ether. It is present to about 10 per cent. in the crude substance. Echugin is a cardiac poison, death taking place in systole.

Remedies in Whooping-cough.—Dr. Schilling (*Therap. Monatsh.*) has used inhalations of chloroform, 2 or 3 drops for each year of the child's age, with a tablespoonful of water; inhalations with phenol were less satisfactory. Dr. Steep (*Deutsche Mediz. Wochensch.*) employed *bromoform*, giving from 5 to 20 drops in 24 hours in very frequent doses. The mixture requires the addition of some alcohol. Pulse and temperature are not affected by bromoorm and no ill effects are produced.

GLEANINGS IN MATERIA MEDICA.

By John M. Maisch.

The oleo-resinous exudations of the different species of *Araucaria* differ from those of other coniferæ in containing much gum. Heckel and Schlagdenhauffen found that the secreting glands at first contain oleo-resin. Afterward the neighboring cells form papillæ, projecting into the glands, and are converted into arabin which mixes with the oleo-resin. The proportion of gum varies between 29 and 93 per cent. and it usually contains a little sugar. The gum-resin of *A. Bidwilli* yields to alcohol a crystalline body apparently identical with pinit of *Pinus lambertiana*. The oleo-resins and volatile oils are dextro-gyrate. The alcoholic solutions contain no inorganic matter, but the water-soluble portion leaves an ash of calcium chloride with some sulphates and carbonates, and little iron and manganese.—*Compt. Rend.* cix, 382.

Xanthoxylum senegalense, DeCandolle, s. Fagara zanthoxyloides *Lamarck*, has been examined by P. Giacosa and M. Soave, who found in the root bark three alkaloids, one of which has the composition $C_{21}H_{23}NO_4$ and is stated to be very similar to berberine. The authors call it *artarine*, the drug being known as *artàr-root*. A compound having the composition of cubebin was likewise isolated. The transverse section of the root is yellowish with white dots. The wood is hard and has fine wavy medullary rays.

Xanthoxylum Naranjillo, DeCand. is used as a sudorific and diuretic in the Argentine Republic. Parodi has found in it a volatile oil and an alkaloid.—See also Amer. Jour. Pharmacy, 1882, p. 134; 1884, p. 579 and 627; 1886, p. 72.

Digitalin, on being heated in a sealed tube with barium oxide and water to 180° C., yielded to Arnaud (*Compt. Rend.*, cix, p. 701) a crystalline compound having the composition $(C_{31}H_{51}O_{11})_2Ba$. It is insoluble in water, but somewhat soluble in boiling alcohol. It is the barium derivative of the compound $C_{31}H_{52}O_{11}$, which is formed from digitalin, $C_{31}H_{50}O_{10}$, by the assimilation of water.

Tanghinin, under similar conditions, yields a barium derivative of the compound $C_{27}H_{44}O_{10}$. $2H_2O$ having been assimilated, thus making the composition of tanghinin $C_{27}H_{40}O_8$.

Mandragorine, the alkaloid of mandragora root was isolated by F. B. Ahrens (*Annalen*, ccli, p. 312). Mandragorine is colorless

inodorous, deliquescent, soluble in the ordinary solvents and produces mydriasis. The sulphate and hydrochloride are crystalline and deliquescent. Mandragorine has the formula $C_{17}H_{23}NO_3$ or $C_{17}H_{27}NO_3$. It is not converted into atropine by alkalies.—*Berichte*, 1889, p. 2159–2161.

Scutellarin, $C_{10}H_8O_3$, has been isolated by Takahashi (*Chem. Centr.* 1889,) from the root of *Scutellaria lanceolaria*, by treating the ether extract with caustic soda, acidulating the alkaline liquid and purifying the yellow precipitate. Scutellarin forms flat yellow needles, is inodorous and tasteless, melts at 199° C., is sparingly soluble in hot water, but dissolves in other simple solvents, in alkalies and without change also in sulphuric acid. Nitric acid dissolves it with a red color. It is not a glucoside but appears to be a phenol. In 5 gm. doses given to a dog it produced no effect.

Carbohydrates and cupric oxide.—C. L. Guignet observed that cuprammonium sulphate yields no precipitates with gums, pectins and extractive matter, but gives blue precipitates, soluble in ammonia, with mannit, dulcit, glucose and galactose; while saccharose, lactose, invert sugar and levulose are not precipitated. Starch, starch-paste and inulin absorb cupric oxide from ammoniocupric oxide solution.—*Compt. Rend.*, cix, p. 528.

Pineapple juice was found by Dr. Flascher of excellent service in bronchitis, in softening the mucus. For preparing the juice, the fruit is sliced, sprinkled with sugar, heated to boiling, and strained. The dose is about two tablespoonfuls.—*Lyon Médicale*, Oct., 1889.

Cocillana, a species of *Guarea*, nat. ord. Meliaceæ, has recently been lauded as an expectorant somewhat similar to ipecac in its effects, and to possess also valuable tonic and laxative properties. The genus comprises about 70 species, 3 of which have in former times attracted attention on account of their asserted purgative and emetic properties and their supposed usefulness in various chronic diseases. Guarea trichiloides, *Lin.* G. Swartzii, *DeCand.*, and G. purgans, *St. Hil.*, are small trees of which the bark has been mainly employed.

The bark of the locust-tree, Robinia Pseudacacia, *Lin.*, has been examined by Prof. F. B. Power and Jacob Cambier (*Phar. Rundschau*, Feb., 1890), with the view of determining the principle to which its reputed poisonous properties are due. About 2 per cent.

of fat and resin was obtained; also some cane-sugar, coloring matter, gum, a little tannin and probably asparagin. The presence of considerable starch was demonstrated by the micro-chemical test; but a decoction of the bark, after cooling, is merely colored brown; the principle preventing the appearance of the blue color has not been determined. The bark contains a small amount of an alkaloid, which was shown to be identical with *choline*. Neurine was not present, and when a kilogram of the bark had been allowed to undergo fermentation, a sufficient amount of basic substances could not be obtained to determine their character. The authors then turned their attention to the albuminoid substances and succeeded in isolating a globulin and an albumose, of which the latter produced purging and vomiting. This *phyt-albumose* is tasteless, soluble in water, and coagulated and rendered inert by heat. It is precipitated by potassium-bismuth iodide and by tannin, and from its acidulated solutions by potassium ferrocyanide.

Euphrasia officinalis, Linné, has been recommended by Dr. G. M. Garland (*Boston Med. and Surg. Journ.*, Nov. 7, 1889) as a valuable remedy in coryza, it exerting a powerful action upon the recently-inflamed mucous membrane of the nose and pharynx, but it seems to be of no effect in nasal discharges which have advanced to a purulent or muco-purulent condition. Ten drops of the tincture were given in a little water every two hours. While works of reference, mentioning this drug, usually refer to its use in ophthalmic complaints, in which it had attained much celebrity in former centuries, the National Dispensatory states that it was also esteemed in toothache, and was given, as a distilled water or a tincture, in *chronic* catarrhs.

Papaver Rhœas, Linné.—The petals have again been examined by O. Hesse, who could not obtain any alkaloid from one kilo of the dry and old drug. But the expressed juice of 300 gm. of fresh petals, when carefully concentrated, mixed with ammonia and agitated with acetic ether, yielded a few milligrammes of crystals which were not morphine. They are insoluble in dilute soda, dissolve in dilute sulphuric acid, and the solution is colored red on boiling, but less intensely than a solution of rhœadine. The crystals contained a little rhœadine, but appear to consist mainly of a new alkaloid, which has as yet not been further examined for want of material.—*Archiv d. Phar.*, 1890, p. 7.

ABSTRACTS FROM THE FRENCH JOURNALS.

Translated for the American Journal of Pharmacy.

Extract of Malt as a Solvent of Cod Liver Oil.—M. Adrian, (*J. de Ph. et de Ch.*, Jan.), writes that the mixtures of cod liver oil and extract of malt of which considerable has been said of late, should not be regarded as solutions, for they are simply "commenced emulsions" to which the water has yet to be added. M. Adrian says, moreover, that the preparation does not constitute a practical mode of giving cod liver oil, because it forms a sort of jelly in which the taste of the oil is not disguised, while the material remains too long in the mouth. If the jelly be diluted in milk, as has been proposed, the taste is quite disagreeable and the medicament becomes too bulky. M. Adrian adds: "This mode of administration is not new; it was signalized in 1876 by the American Journal of Pharmacy (page 534)."

Administration of Kermes.—M. Corivaud, *Répert. de Phar.*, Feb. 10), claims that some physicians are opposed to the trituration of kermes (oxysulphuret of antimony) to be used in potions, on the ground that the process disengages sulphuretted hydrogen and makes the preparation disagreeable to take. At the same time, not to pulverize the kermes is to invite precipitation. M. Corivaud gets over the difficulty by performing the pulverizing process in a wedgewood mortar, adding to the kermes five times its weight of gum arabic.

Antiseptic Powders for Midwives.—M. Budin has requested the Paris municipal authorities to permit pharmacists to dispense upon the prescriptions of midwives an antiseptic preparation composed as follows: Bichloride of mercury, 25 cgm.; tartaric acid, 1 gm.; mark, "corrosive sublimate, 25 cgm.; poison; for one litre of water." Professor Budin also advises the use by midwives of a 1 per cent. ointment of bichloride of mercury with vaselin. *Acad. de Méd.*, Feb. 11; *Monde phar.* Feb. 20.

Artificial Balsam of Peru.—"This balsam is so frequently adulterated that it is proper to consider the feasibility of making a chemically pure substitute for it by employing only its active constituents. The drug contains upward of 60 per cent. of cinnamein, that is to say, of the benzylic ethers of cinnamic acid C_7H_7, $C_9H_7O_2$, and of benzoic acid C_7H_7, $C_7H_5O_2$; 10 per cent. (about) of free

cinnamic acid, and a small quantity of free benzoic acid. Binz supposes that a mixture of the ethers with these free acids, in the same proportions as they exist in the balsam of Peru, would have the same effect as the latter upon the organism." *Rev. int. des Fals.*; *Le Monde phar.*, Feb. 20.

Guaiacol and Creosote.—By uniting guaiacol with creosote, Dr. Bourget claims (*Bull. Thérap.*) to be able to give considerable doses of the latter without causing gastric disturbance. In his "intensive" treatment of tuberculosis, he makes use of the following formulæ: Guaiacol, 7·50 gm.; tinct. cinchona, 20 gm.; Malaga wine, 1,000 gm. He commences by giving a talbespoonful of this (or 15 cgm. of guaiacol) with each meal. The dose is gradually increased to 3 tablespoonfuls, or until the patient is taking 1 gm. of guaiacol. The medicaments may be given in an enema composed as follows: Guaiacol, 2 gm.; oil of sweet almonds, 20 gm.; gum arabic, pulv., 10 gm.; emulsify, and add water, 950 gm.; to make 4 enemata. In winter, the wine of the first formula may be replaced by cod liver oil. For the external treatment of tuberculosis, the author prescribes the following mixture to be applied on the chest, back and arms, with friction: Creosote, 20 gm.; cod liver oil 200 gm. *L'Union pharm.*, Feb.

To Bleach Glue.—A writer in the *Monit sci.* says, that to add oxalic acid and white oxide of zinc, in the proportion of one per cent. to the glue to be treated, gives a whiter and clearer product than any of the measures now in use. The glue should first be reduced with water and heat to a thick pulp, and the chemicals added while the mass is hot. The same process may be used for bleaching blood-albumen, but the degree of heat should not be above 122° F., or the albumen will coagulate.

Local Anæsthesic Action of Strophanthin and Ouabaine.—In a paper read at a recent séance of the French Academy of Medicine, Prof. Panas presented the following conclusions of results obtained by him with the substances named: "Ouabaine, which possesses anæsthesic properties as applied to the eyes of rabbits, does not appear to exercise any action of this kind upon the human eye. Strophanthin has an anæsthesic action upon the human eye, but, owing to its very irritating effects its use should give way to that of cocaine. The same is true of erythrophleine and other substances proposed to effect local anæsthesia. Thus far, cocaine

alone merits the favor of ophthalmologists." *Nouveaux Rem.*, March 8.

Solubility of Caffeine with Antipyrin.—M. Crinon reports, as a result of recent experiments made by him, that by adding to caffeine an amount of antipyrin slightly in excess of its weight it becomes perfectly soluble in water without the aid of heat. With heat he dissolved 50 cgm. of caffeine in 10 gm. of distilled water after adding 75 cgm. of antipyrin, and the solution remained limpid. The author adds that if the caffeine be prescribed for neuralgia or hemicrania, the antipyrin associated with it will aid in producing the desired effect.

Panbotano as a Substitute for Sulphate of Quinine. — At a recent meeting of the French Academy of Medicine, Professor Dujardin-Beaumetz stated that he had received form M. Valude, of Vierzon, a paper relating to a new specific for the fever and other symptoms of paludism. This medicament consists of the bark of the panbotano, which is a leguminous tree (suborder mimosed) of Mexico, isolated plants being cultivated in some parts of Europe. M. Villejean has studied the bark and found fatty matters, tannin, etc., but no alkaloid or glucoside. M. Valude administered panbotano bark to his patients in form of an alcoholic tincture, and also gave a preparation made by maceration. He preferred the latter, which he made by putting 70 gm. of bruised bark into a quart of water and boiling down to a pint, this being the quantity to be taken in twenty-four hours. In the eight paludic cases described by M. Valude a single dose, or, at most, two doses, caused the disappearance of well-defined tertian fevers.—*Bull. méd.; Nouveaux Rem.*, March 8.

COD LIVER OIL EMULSION.

By Herbert Graham, Hospital Steward, U. S. A.

Cod liver oil emulsions, in various forms, are preparations which have of late become somewhat popular. I express no opinion whatever on any of these preparations, far less do I intend to individualize any preparation by attempting to give a copy of the formula. I simply recognize the unfortunate necessity which sometimes arises of following where our inclination does not lead, and I therefore give a formula for an emulsion, believing it, without prejudice, equal to any of the many now before the profession and the public.

Of all the excipients suggested by different authorities as well as commending themselves to one's own approval for emulsifying cod liver oil, none, I think, equals gum tragacanth. Without, therefore, ignoring other substances, such as mucilage of gum arabic, white of egg, alkaline solutions, and so on, I have principally endeavored to ascertain the conditions most favorable to produce with tragacanth an inseparable emulsion, which, at the same time, would be miscible with water, contain a reasonable amount of oil, and be not particularly objectionable in appearance, taste or smell. Of course, in all these preparations, much may be left to individual fancy as to combination; and I, therefore, make no suggestion as to all the different ingredients which may be added, further than this, that if oil of bitter almond be the flavoring agent used, both experience and experiment have determined that a half per cent., or about two drops to each ounce of cod liver oil, is the proper proportion; and that of the two oils, namely, an oil deprived of its hydrocyanic acid, or an oil containing it, the latter is preferable.

As to the emulsion, let three drachms of the finest white powdered tragacanth be rubbed up in a large mortar with three ounces of glycerin, to this add as much boiling water as will convert it into a thick, transparent jelly, from eight to ten ounces probably being required. After cooling add the cod liver oil, which should first be mixed either with plain water or lime-water, in the proportion of one of the latter to three of the oil; or, if the emulsion is intended to contain the hypophosphites of lime or soda, let these be added to the plain water previous to mixing with the oil, and then let this primary emulsion be gradually added to the mucilage of tragacanth with constant stirring. In the process of mixing, the emulsion not only creams but also thickens up to a certain point; the individual taste must settle the extent to which the mixture may be carried. I have found the three drachms of tragacanth emulsify from fifty to eighty ounces of what I have called the primary emulsion, the former quantity being very thick and not easily poured from the mortar, the latter quantity flowing more freely and forming what I consider the better emulsion. In mixing the oil with the mucilage of tragacanth, care must be taken not to add it too hurriedly, else it will not emulsify; the mixture will simply break up into a clotted mass, and no amount of labor, apparently, will bring it back to the emulsified form. Under these circumstances, the better way is at

once to begin again with a small quantity of fresh mucilage, to which the clotted mass should be carefully added by degrees. In this way only can the emulsion be brought back to its proper form. FORT WARREN, BOSTON, MASS.—*Medical News*, March 15, 1890, p. 283.

NOTES ON SOME GUM SAMPLES.[1]

BY THOMAS MABEN.

This paper, which does not profess to be exhaustive, consisted of a series of notes—chemical, pharmaceutical and commercial—on some samples of acacia and other gums. For information and assistance, the author expressed his indebtedness to Mr. E. M. Holmes, Mr. Jackson, A.L.S., and Mr. Hillier, of Kew, and especially to Mr. A. C. Meyjes, of *The Chemist and Druggist*, who had supplied most of the samples, as well as valuable commercial notes regarding them. There were twenty-one samples in all, and they comprised Egyptian, East Indian, West African, Cape, Australian, and Brazilian gums. Commencing with a sample of picked Kordofan gum, which showed the characters of the best acacia gum, Mr. Maben gave a short historical notice of the course of trade in this commodity during the past few years, and then referred briefly to Geddah gum, Aden gum and Gehzirah and Talca gums. Two samples of Senegal gum ("gomme du Bas du Fleuve" and "gomme de Galam") were shown and described, and an account was given of the gum trade on the Senegal river. This trade is entirely in the hands of the French, and some few years ago the Bordeaux merchants formed a syndicate for the control of the article, and succeeded in forcing up the price from 52*s.* 6*d.* per cwt. in January, 1885, to 125*s*, in April, 1888. Since that time there has been a gradually slackening demand, and in the last market report of *The Chemist and Druggist* (February 15), it was stated "that there has been a serious decline in the price of Senegal gums, both varieties being easily obtainable at 85*s.* per cwt." Many of the so-called Arabic gums now met with were said to consist of a large admixture of Senegal gum.

[1] Abstract of a paper read before the North British Branch of the Pharmaceutical Society of Great Britain, February 19th; reprinted from The Chemist and Druggist, 1890, p. 247.

There were shown three samples of Barbary or Mogadore gum. White Barbary, the best variety of the three, is not unlike Turkey sorts, but is rather dirtier. It is perfectly soluble in water, gives a bright transparent mucilage, free from odor, and keeping well. This white gum is an import of rather recent date, and is thought by some to be a Soudan gum, which now finds its way by a diverted route to the Northwest instead of the Northeast of Africa. Five samples of East Indian Amrad gums were shown. These have already been described by Mander, and were only briefly referred to. Special attention was drawn to Cape gum, of which three samples were shown. Two varieties of this gum are imported—one the hard brown Cape, which is obtained from *Acacia horrida*. This has been known for many years, and is described in *Pharmacographia*; but more recently, since the closing of the Soudan, another variety has been regularly consigned to the London markets. This is "soft white Cape," which is supposed to be gathered in the northern parts of Cape Colony, beyond the Orange river. A sample of fine picked white Cape showed as fine an appearance as any Kordofan gum, and so like is this to the old Turkey gums that it is thought by some that the white Cape is simply what we formerly received from the Soudan, and which is now brought by Arab traders right across Africa. This is a doubtful hypothesis, however, for if gums found their way so far south we would surely receive some by way of Zanzibar. Australian gum was next touched upon. This gum gives a thin mucilage, which, on standing, separates, a brownish deposit settling down with a pale, clear supernatant mucilage. The pure gum contains no tannin, but associated with it are pieces of wood, which impart a trace of tannin unless they are removed. The market for Australian gum is limited in this country, but it is said to be employed to a considerable extent in Russia and Sweden. Three samples of Brazilian gum were shown, one of which was sent to Mr. Maben by Mr. E. M. Holmes, from the museum at Bloomsbury Square. This gum occurs in large dark-amber or dark-brown glassy drops, and is soluble in water. The mucilage made from it is thick, but only moderately adhesive. Ghatti gum was described, and Mr. Mander and Mr. Prebble were quoted for information regarding it. The author did not regard Ghatti gum with so much favor as Mr. Mander, chiefly owing to the disagreeable mawkish flavor, which he thought would prove an obstacle to its general employ-

ment in pharmacy. Oomra gum, or according to Prebble, "Babool gum," was shown. This gum gives a dark-colored adhesive viscid mucilage, which for many purposes might be useful. Referring to the relative value of the different gums for pharmaceutical purposes, the author said that the dark-colored gums, or gums which gave a dark-colored mucilage, might be at once dismissed from their notice, for however valuable many of them might be in the arts, or for the purposes of the confectioner, it was obvious that they were unsuitable in pharmacy. There remained not very many to pass an opinion upon, and these he was disposed to place in this order: Cape gum, Senegal gum, Barbary gum, the paler varieties of E. I. Amrad gums and Ghatti gum. All of these possessed good emulsifying properties, and gave a clear good-keeping mucilage. A summary of the transactions in gum, recorded in *The Chemist and Druggist* market reports, was given. According to this, there had been sold during the last few months:

	£	s.	d.		£	s.	d.	
Brazilian gum, ... at from	1	8	0	to	3	0	0	per cwt.
Aden gum, scented, ... "	1	10	0	"	3	0	0	"
" " unscented, . . . "	3	0	0	"	4	10	0	"
Oomra gum, ... "	2	0	0	"	2	19	0	"
Australian gum, ... "	1	5	0	"	3	4	0	"
Ghatti " . . . . . "	1	8	0	"	4	14	0	"
Geddah and Talca, ... "	4	5	0	"	4	15	0	"
Amrad gums, ... "	2	0	0	"	5	5	0	"
Cape " . . . . . "	2	0	0	"	5	5	0	"
Barbary or Mogadore gums, . "	2	2	0	"	5	12	6	"
Senegal gum, ... "	4	2	6	"	5	15	0	"
Turkey " . . . . . "	5	0	0	"	16	10	0	"

In addition to these, parcels of Cape gum have been sold for £14 10*s*, and Mogadore for £14 5*s*., while £25 per cwt. was asked for a parcel of fine Turkey.

The reactions of the various mucilages were gone into. All the samples gave precipitates with alcohol and ammonium oxalate, although with the latter, Brazilian and Australian gums gave only faint reactions. With borax, acacia mucilage hardened into a gummy mass; similarly with basic lead and ferric chloride, while it gelatinized and formed a softer mass with silicate of potash. Generally speaking, similar reactions were obtained with Senegal gums, the E. I. Amrad gums, white Barbary, the Cape gums and Geddah

gum. Barbary brown and Amrad give only a jelly with borax. Australian gum has no reaction with ferric chloride and potassic silicate; Brazilian gum has no reaction with potassic silicate, but gelatinizes with borax and ferric chloride, and slightly with basic lead. Ghatti gum gelatinizes with all four, but only slightly with potassic silicate. Oomra gum reacts similarly to acacia, except that it is entirely unaffected by basic lead, and forms a softer jelly with ferric chloride.

A NEW SYSTEM OF OLD WEIGHTS AND MEASURES.

By Joseph W. England, Ph.G.

The Revision Committee of the U. S. Pharmacopœia, soon to convene, will probably have no more important problem before it, for consideration, than the subject of weights and measures. Whether to adhere to the present plan of "parts by weight," which has been so unfavorably received, or, to return to the cumbrous system of troy weights and measures of the older Pharmacopœias, or, to adopt an avoirdupois method, or, to use a new system entirely, will be the question for decision.

The Pharmacopœia has been framed with the intention of serving two purposes, the first, the recognition of remedies required by the physician; the second, the recognition of methods in pharmaceutical work required by the pharmacist.

Apart from the very important question of what remedies to admit and what to reject, physicians have little practical interest in the Pharmacopœia, and they have rightly come to regard it as almost wholly a daily work-book for the practice of pharmacy.

In confirmation of this view, the following abstract from an editorial on "The Pharmacopœia of 1890," in the University Medical Magazine (March, 1890, p. 328), is of interest:

"As we understand the functions of the Pharmacopœia, its duty is simply to decide what drugs shall be kept most commonly upon the shelves of the druggist, and for the purpose of directing him in the manufacture of certain articles. So far as its relation to the medical profession is concerned, it is to be regarded simply and solely as a list which in no way affords practical advice unless the physician is so placed as to be forced to manufacture his own medicines, a duty seldom performed at this time by any one, owing

to the fact that he can obtain, already prepared for him, suitable drugs made in large quantities by reliable manufacturing firms."

The decrees of the Pharmacopœia are limited in operation because its powers are limited, and its powers are limited because it is neither issued under governmental auspices nor empowered to act by legislative enactment, and is accorded only that authority which comes from common consent; hence, unlike all foreign standards, it is but a quasi-legal standard, with no legal power to make decrees and no authority to punish their violation.

With such a condition of affairs existing, coupled with a positive and almost ineradicable antagonism—an antagonism as old as the Anglo-Saxon race itself—against weighing liquids and with an insufficient education upon the merits of the metric system, is it strange that the premature adoption of "parts by weight" has been such a signal failure? If the dispensatories and commentaries, appreciating the public need had not seen fit to insert in their works, equivalents alongside of pharmacopœial formulas, it is questionable whether many pharmacists would not have adhered to the earlier standards.

In 1887,[1] Prof. Joseph P. Remington, in an admirable paper, read before the Penna. Pharm. Association, entitled "Weights and Measures in Liquid Preparations," after disposing of the fallacy that, practically, greater accuracy is obtained by weighing liquids than by measuring them, said: "It needs very little time to prove that after five years' trial before the country, the consensus of pharmaceutical opinion is greatly in favor of weighing solids and measuring liquids."

What was true at that time is equally true now.

The universal creed of English-speaking pharmacists is: Solids by weight, liquids by measure, and, had the Revision Committee seen fit to boldly adopt, in all formulas, the gram for solids and the cubic centimeter for liquids, the metric system would be standing on much firmer ground to-day, and their action would have been eventually sustained. As the case is, where there was apathy and indifference before, there exists positive antagonism, and the whole metric system has no brighter prospects now than then.

Viewed in a purely scientific light, the high value of the metric system cannot be questioned, but it is in the every-day life of the

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[1] A. J. P., 1887, p. 328.

working pharmacist that its adoption is desired, and the road to its adoption in this country lies through the recognition of the gravimetric system for solids and the volumetric system for liquids.

Now, in the face of this national feeling, it is idle to continue a system which has failed of adoption, and it seems equally undesirable to take what might be regarded as a scientific step backwards, by returning to the empirical system of the Pharmacopœia of 1870. Further, it would be unwise to adopt any new measures, in view of the undoubted confusion which would result from the multiplicity of measurements. But, what is needed is the adoption of a new system of old measurements; a system exceedingly simple, easily divisible, ready of application in any drug store with present weights, and representing in working formulas the metric system.

If we examine the structure of the metric system closely, we see that its scientific strength is due to its simplicity, its ready divisibility, its peculiar relation of volume to mass, or rather cubic centimeter to gram, and to the fact that it is essentially a percentage system. These qualities are all desirable elements and any system proposed in its place must possess them in an eminent degree, and, in addition, be so framed that when the time comes for the adoption of the metric system by the American pharmacist—and it will eventually come—the change can be made without confusion.

To accomplish this would demand the percentage plan, if not percentage by weight, then percentage by volume; it would demand that there be few weights and few measures; it would demand that the standard volume should hold the same peculiar relation to the standard weight that the cubic centimeter does to the gram, that is, that the former volume, in distilled water at a standard temperature and pressure, should weigh the latter weight.

There is no practice more firmly entrenched in American pharmacy than the use of the grain and the troy ounce for weighing solids. In convenience, ready, fractional division and general use, they are pre-eminent. They hold the same intimate relation to practical pharmacy in this country that the gram and kilo hold upon the Continent. If then, there is any modification of the troy system adopted, it would be unwise to disturb that gravimetric portion of it.

The U. S. Pharmacopœia has made the weight of its fluid ounce in distilled water at a standard temperature and pressure, 455·7

grains, thus making its minim 5·33 per cent. short in weight of a grain. The British Pharmacopœia has made the weight of its fluid ounce, in distilled water, at a standard temperature and pressure, 437·5 grains, thus making its minim 9·71 per cent. short in weight of a grain.

It is to be regretted that these two authorities of English speaking pharmacists have not agreed upon a uniform standard, both for solids and liquids, and, it is doubly to be regretted that in neither of their systems does the lowest volume, in distilled water under standard physical conditions, weigh the lowest weight. If such a relationship was established between minim and grain, it would hasten the adoption of the metric system, because that peculiar relationship is one of its vital features, and if a further advance was made and percentage formulas adopted, there would be nothing whatever to prevent our "foreign cousins," here resident, from using the gram and the cc., by substituting them in the formulas for the troy ounce and the fluid ounce, whilst Americans could have all that they have ever had. For instance, if a tincture, wine, spirit, or liquor was made by the one method, we could have 10 troy ounces of drug represented in 100 fluid ounces (new standard) of liquid, or 10 per cent. by volume; or, if made by the other, 100 grams in 1,000 cc., or 10 per cent. by volume.

In short, the writer would advocate (1) The use of weights, grains and troy ounces for solids, and measures, minims and fluid ounces for liquids; each minim in distilled water at its maximum density, etc., to weigh exactly one grain and each fluid ounce 480 grains. (2) The use of a percentage plan in the framing of formulas.

The changes from the present order of things would then be these: Our solids would be weighed by the old grain and the old troy ounce, but our liquids would be measured by a new minim and a new fluid ounce, which latter would each be 5·33 per cent. greater in volume than before, and liquid preparations made with them, therefore, would be 5·33 per cent. weaker in strength of drug, with the exception of fluid extracts. These, since each cubic centimeter is now made to represent 1 gram of the drug, or 100 per cent. by volume, *would remain unchanged in strength.* For example, if each fluid ounce (new standard) was made to represent one troy ounce of the drug, it would indicate 100 per cent. by volume just the same.

So, in thus reducing the strength of liquid preparations uni-

formly 5·33 per cent., the Revision Committee would be simply carrying out its original action to a logical conclusion, with this advantage that in the second case the alterations in strength would relatively be so much less, because those preparations are as a class so much weaker in strength of drug, representing as they do, only 10 to 20 to 40, and in one case 50 per cent. of fluid extract strength.

As regards the framing of formulas on the plan of percentage, there is everything to say in its favor. It is simple; it indicates, at a glance, the percentage of ingredients; (percentage of weight in the case of solids and percentage of volume in the case of liquids); it involves no change of existing weights, only measures; it is readily applied; and it is an easy, feasible stepping-stone towards the ultimate adoption of the gram and the cubic centimeter.

But, it may be argued, if you go this far and adopt this form of arrangement, why not go further and accept the gram and the cubic centimeter? Because, there is just this vital point to be considered: The great majority of American pharmacists have never employed weights and measures on the percentage plan, and if you introduce percentage with strange and unfamiliar weights and measures, they will not near as readily adapt themselves to changed conditions, as if you first employed it in every-day familiar measurements. The best and quickest way towards the ultimate adoption of the gram and cubic centimeter, is through the intermediate adoption of percentage adapted to familiar weights and measures.

It should not be assumed that a percentage-troy system for making pharmacopœial preparations would require prescriptions to be written in such a system. Far from it. Physicians, in their domain, are a law unto themselves, but the pharmacist should equally maintain that in his province his convenience should be consulted. Pharmacists must take an advanced position on this question. It is to their interest more than it is to the physicians to have the working formulas of the Pharmacopœia eminently practicable. If they wait until physicians take the initiative and adopt a metrical system in their prescriptions before adopting one for their own preparations, they will have a long, long weary wait, judging from present apathy on the subject. The writer may be pardoned for quoting personal experience when he states, as some evidence of the use, or rather lack of use, of the metric system in Philadelphia, that of the nearly 500,000 prescriptions over which he has had

supervision in preparation during the last five years, there have been but two metric prescriptions. From inquiries he has reason to believe that the general experience differs but little from his.

The proposition herein advanced is in the nature of a compromise, but has ever a measure been proposed so well adapted to meet the common need; producing a minimum of evil and a maximum of good? Further, it is in complete harmony with the requirements of that eminently fair standard adopted in a resolution to the Revision Committee by the American Pharm. Association, at its meeting in 1889,[1] which reads as follows: "That it is the sense of this Association that in the next revision of the U. S. Pharmacopœia, all preparations, at least those for internal use, which are usually prescribed and administered by measure, be ordered to be made by weight and measure, as in the former Pharmacopœias; but that the Committee of Revision shall be at liberty to use the system of parts by weight in all other cases, and, that they may use any other system, so long as the measures or weights are commensurate with each other and of such a character that the strength of the product, and of any given fraction thereof, can be readily ascertained without tedious calculations."

In the warmth of his admiration for the high scientific character of our present Pharmacopœia, the writer yields to no one. As equals, it has few; as superiors, none. But, in his opinion, its one vital defect is the general presence of "parts by weight." That system does not meet the approval of a majority of American pharmacists, and, in the absence of legal authority on the part of the Revision Committee to issue decrees, cannot be universally enforced.

Is it not wiser, then, to recognize that fact and render the work as authoritative as common consent can make it, by making it as popular as possible? That can be done by having the working formulas simple in structure and adapted to existing, national, conditions. For, after all, "the knowledge that a man can use is the only real knowledge; the only knowledge that has life and growth in it and converts itself into practical power. The rest hangs like dust about the brain, or dries like rain-drops off the stones." (Froude).

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[1] A. P. A. Proceedings, 1889, pp. 39–47.

THE MEDICINAL USES OF LEAVES.

By P. L. Simmonds, F.L.S.

It is strange how assiduous and successful both civilized and savage man have been, in utilizing for some economic purpose, every portion of various plants. Roots, stems, barks, saps and exudations; leaves, flowers, fruit and seeds are alike applied to some useful employment; especially has this been the case in pharmacy and medicine. To take one branch of vegetation, the foliage of plants, what a curious investigation for study does it offer in the form, color, texture and qualities of various leaves, and the employment of some for food, for dyeing and tanning, for textile manufacturing and other economic applications, and for their medicinal properties. It is the last division I propose to consider here. Through the vulgar error of undervaluing what is common, we are apt to pass leaves by as of little worth. A close scrutiny and careful examination would convince us of the economic importance of these foliose organs. Their dietetic uses are alone of great importance, if we consider merely culinary vegetables, tea and tobacco.

In glancing through various botanical and medical works, I have jotted down the various leaves which have a medicinal or healing reputation, and the list becomes an extensive one. Not that all these have any established reputation, for only a small number are included or recognized in the various nationa pharmacopœias, but their employment points to some general conceived opinion as to their useful properties.

I have not thought it necessary to arrange these under their genera and families, but merely note them as described, under the belief that some among them may be found worthy of closer attention.

The leaves of *Asteracantha longifolia* are used in India as a diuretic.

The foliage of the *Eucalypts* of Australia, especially *E. amygdalina*, *citriodora*, *globulus* and others, yield a large supply of an antiseptic volatile oil of excellent lemon-like fragrance. Cigars made of the leaves have been recommended in asthma.

The leaves of *Pilocarpus Pinnatifolius* are famed as an agreeable, powerful and quickly acting sudorific, and also recommended as a specific in diphtheria, as well as in typhoid fever.

The foliage of *Leonotis Leonorus* has some therapeutic properties; the leaves when used like tobacco are highly sternutative.

Matico, the dried leaves of *Artanthe elongata*, serves as a powerful styptic and for other medicinal purposes.

The foliage of *Artemisia Abrotanum* is used in domestic medicine, and also as a condiment.

The leaves of *Hamamelis virginica* are renowned in the States for their medicinal properties.

The leaves of *Cinnamon*, of the *Camphortree* and of *Tetranthera laurifolia* are used to make aromatic baths for persons suffering from rheumatism.

Bhang consists of the larger leaves and capsules of Indian hemp, which are used for making intoxicating drinks, and a sort of intoxicating conserve or confection, called *majoon*.

The betel leaf (*Chavica Betel*) acts as a powerful stimulant to the salivary

glands and digestive organs. Its use is, therefore, conducive to health, and has been found to be an excellent preservative against scurvy in long sea voyages.

The fresh juice of the leaves of *Clerodendron viscosum* is used as a vermifuge, and also as a bitter tonic and febrifuge in malarious fevers.

The leaves of *Datura Stramonium* are applied to boils and ulcers, and are smoked with tobacco for asthma. Those of *Datura alba* and *D. fastuosa* act as antispasmodics.

The leaves of *Eupatorium Ayapana* have been employed for tea in the Mauritius, and the expressed juice from them is used internally as an astringent.

The leaves of *Sapindus Saponaria* are employed by the creoles in the Mauritius in constipation.

Buchu leaves are the produce of *Barosma betulina or crenata.* In trade this valuable drug is sometimes adulterated by the substitution of leaves of less powerful sorts of the same family of plants, which although of a similar smell, are by no means equal to it in their therapeutical effects ; 94,265 pounds of buchu leaves, valued at £1,307 were shipped from the Cape Colony in 1884.

By some authorities, *B. serratifolia*, Willdenow, is said to furnish the buchu leaves. *B. crenulata*, Hooker, is only a variety of this species. *Empleurum serrulatum*, Solander, also yields some, which are easily distinguished by the linear-lanceolate serrated leaves.

The leaves of the *Feronia elephantum* are aromatic and carminative. In Mohammedan medical works they are described as astringent.

The fresh juice, diluted, of the leaves of *Ægle Marmelos* is largely used in Bengal as an antibilious and febrifuge, and also as a vehicle for other febrifuges. Made into poultices, it is used in the treatment of ophthalmia.

The leaves of *Æschynomene Sesban* are much used in India as a poultice to promote absorption.

The viscid mucilage obtained from the fresh leaves of *Aloe indica* is also used by the natives as an excellent demulcent, especially in gonorrhœa.

The fresh leaves of *Cassia alata*, when bruised and mixed with lime-juice, have been found to act with decided efficacy in ringworm and other similar affections of the skin. Made into a plaster, combined with sandal-wood, the leaves of *Cassia Sophora* are used as a similar specific.

The dried leaves of several species of *Cassia* are largely used in the East, in combination with other drugs, for their purgative properties ; and the leaflets constitute the senna of commerce. *Cassia acutifolia* furnishes part of the Alexandria senna ; *C. angustifolia* yields Mecca and some of the Bombay senna ; *C. obovata* some of the African senna, which is less esteemed and less collected than the other species. *C. elongata* produces several varieties of East Indian. *Cassia Absus* is also one of the sources of medicinal senna leaves.

A decoction or infusion of the leaves of *C. auriculata* is much esteemed as a cooling medicine by the Singhalese, and also as a substitute for tea.

The leaves of *C. Tora* are used as an aperient ; both leaves and seed constitute a valuable remedy in skin diseases, chiefly ringworm and itch.

The pulp of the leaves of *Aloe vera* is in native practice applied to boils, and

is regarded as acting powerfully on the uterus, and to be useful as an emmenagogue.

Dr. White states that the leaves and tops of *Artimisia vulgaris* are used in nervous and spasmodic affections connected with debility.

The leaves of *Hydrocotyle asiatica* have been made officinal in India. They are given in infusion to children in bowel complaints and fevers, and are described as alterative and tonic, and when locally applied, stimulant. They are used in leprosy with good results. In secondary or constitutional syphilis, they are of great value. In ulcers and skin diseases, they are described both internally and externally. On the Coromandel coast, the leaves are applied to bruises.

The dried leaves of *Hyoscyamus niger* are anodyne, sedative and antispasmodic. A preparation from the leaves is useful in nervous irritability, mental excitement, sleeplessness and various other mental disorders.

The aromatic leaves of *Laurus nobilis* possess tonic and febrifugal properties and are in much request for various condiments.

The expressed juice of the leaves of *Eugenia Jambolana* is employed alone or in combination with other astringents in dysentery.

The leaves of *Ferula Narthex* possess sudorific and carminative properties.

The leaves of *Acacia Lebbek* are used for rheumatism in fomentations or baths.

The leaves and young shoots of *Persica vulgaris*, in infusion, are said to be stomachic and vermifugal.

An infusion of the leaves of *Caryophyllus aromaticus* is given as a carminative in disorders of the stomach and colic.

The leaves of *Vinca rosea* have been found useful in cholera, dysentery and cutaneous diseases.

The leaves of *Ocimum gratissimum* are employed in aromatic baths; sometimes with tobacco leaves in rheumatic complaints and paralysis.

The leaves of *Faham* (*Angrœcum fragrans*), made into a beverage, are considered pectoral and stomachic. Dried, they are smoked in cases of asthma.

The leaves of lemon grass, *Andropagon Schœnanthus*, also make a pleasant warm and diaphoretic infusion—a grateful drink in febrile affections.

The leaves of *Arctostaphylos glauca* are used medicinally; when chewed, they excite the flow of the saliva and give a peculiar, strongly astringent, slightly bitter taste afterwards.

The leaves of *Larrea americana*, sometimes called the creosote bush, are highly esteemed in California by the natives as a tonic and corrective of the system. They are sticky, with a strongly scented gum or resin.

A decoction of the leaves of species of *Melaleuca* is much used in China as a tonic.

The leaves of the *Guava* tree, *Psidium pomiferum*, in decoction, were considered a remedy in the time of cholera in the Mauritius against vomiting and diarrhœa.

The leaves of *Argyreia speciosa* are employed for headache.

Pari leaves (*Cissampelos Pareira*) are said to possess the virtue of congealing water.

The bruised leaves of *Saponaria officinalis* form a lather, which much resembles that of soap when agitated in the water, and is similarly efficacious in removing grease spots.

The leaves of *Erythroxylon Coca*, having been scorched and well dried, are used for chewing, mixed with a little lime. Taken in moderation, they have a most extraordinary effect as a nervous stimulant. There are many medicinal preparations made from coca leaves.

The leaves of the Baobab tree, *Adansonia digitata*, are eaten by the Africans with their food, and are said to restrain excessive perspiration. A strong decoction of the leaves of *Dodonæa salicifolia* is employed as a gargle, or injected in the throat.

The leaves of the plantain, *Musa paradisiaca*, are antiseptic, and heal old ulcers and putrifying sores.

A lotion of the leaves of *Sesamum indicum* is used as a hair wash by the Asiatics, and is supposed to promote the growth of the hair and to make it black. As the leaves contain a quantity of mucilage, they are employed in North America to make a demulcent drink for catarrh.

The leaves of *Cinnamonum Tamala* and *C. albiflorum* possess carminative and stomachic properties, and are much used as a condiment in India.

The leaves of *Caryodaphne densiflora* are gratefully aromatic, and are used in infusion like tea, against spasms of the bowels. There are many other aromatic leaves, which are used by cooks and confectioners for flavoring food.

The leaves of *Premna integrifolia* are bitter and carminative, and rubbed along with pepper, are administered in India in colds and fevers.

The fresh juice of the leaves of *Ricinus communis* is used as an emetic in poisoning by opium and other narcotics, and in decoction or poultice may be used as a lactogogue.

The leaves of *Tamarindus indica*, crushed with water and expressed, yield an acid fluid, useful in bilious fever and some urinary complaints; made into a poultice, they are applied to reduce inflammatory swellings and to relieve pain.

The leaves of *Trichosanthes dioica* constitute a bitter tonic. In bilious fever, a decoction of the leaves, with coriander in equal parts, is given as a febrifuge and laxative.

The dried leaves of *Tylophora asthmatica* are emetic, diaphoretic and expectorant, useful in overloaded states of the stomach and other cases requiring emetics. It has also been found useful in dysentery, catarrh and other affections in which ipecacuanha has to be employed.

The leaves of *Vitex Negundo* are aromatic, tonic and vermifuge, and given in decoction, with the addition of long pepper, in catarrhal fever, with heaviness of head and dulness of hearing. A pillow stuffed with the leaves is placed under the head to relieve headache. The juice of the leaves is applied to ulcers.

The bruised leaves and ground root of *Withania somnifera* are employed as a local application to carbuncles, ulcers and painful swellings.

The leaves of *Aristolochia indica* are famed as an alexipharmic.

The leaves of *Clematis mauritiana* applied to the skin serve as a blister, and are recommended in rheumatism, lumbago, and other affections of the skin.

The foliage of *Althæa officinalis* is much used for medicinal purposes in

France. In the Mauritius, the leaves of the *Waltheria indica*, also known as "Guimauve," are used for their mucilage.

An infusion of the leaves of *Zizyphus Jujuba* is a popular medicine in Mauritius in cases of asthma and oppression.

The leaves of *Psoralea glandulosa* are regarded as a powerful vermifuge and a good stomachic.

The leaves of *Cajanus striatus*, roasted and powdered, are a powerful diuretic, and are given in derangements of the stomach, colic, etc. The bruised leaves are effectual in hemorrhages.

The leaves of *Melia Azadirachta* are stimulant, and applied to ulcers and skin diseases of long standing. They are also used in the form of poultices, to disperse glandular tumors, and in the form of a pulp, in cases of pustular eruptions and small-pox. The leaves of another species, *M. Azedarach*, have similar properties, and are used internally and externally in leprosy and scrofula.

The juice of the tender leaves of *Nerium odorum* forms in India a remedy for ophthalmia. A decoction of the leaves is said to reduce swellings.

The juice of the leaves of *Ocimum Basilicum* forms an excellent nostrum for the cure of ringworm, and the bruised leaves for scorpion stings.

The mucilage of the fresh leaves and stems of *Pedalium Murex* is highly valued by the people of Southern India as a medicine in gonorrhœa and dysuria. The leaves have an odor of musk ; when fresh and stirred in water, they render it mucilaginous. Buttermilk in India is often fraudulently thickened by the use of these leaves.

The leaves of *Ptychotes involucrata* are used by the natives of India as a condiment and also as a stomachic and carminative in flatulency and other similar diseases. Though of an unpleasant smell, the leaves are now and then used as a substitute for parsley by Europeans.

A decoction of the leaves of *Uncaria Gambir* is evaporated by fuel and solar heat, and contains a large percentage of tannin, hence it enters largely into commerce for dyeing and tannin.

The powder of the dried leaves of *Lygodium flexuosum* is used with alleged success as a powerful errhine in obstinate headache.

The juice of the fresh leaves of *Momordica Charantia*, mixed with warm water, has been successfully used as an anthelmintic.

The leaves of *Vitex trifolia* are considered useful as an external application to all rheumatic pains, sprains, etc. The powdered leaves have been given with success in cases of intermittent fevers.

The leaves of *Polanisia icosandra*, bruised and applied to the skin, act as a counter-irritant, and in delicate constitutions, as a blister.

The leaves of *Erythrina indica* are used in cases of fever by the natives of India, and are sometimes applied externally, to disperse venereal buboes and relieve pains on the joints.

The leaves of species of *Euphorbia*, when warmed, are applied over the hypogastric region, and are said to promote the secretion of urine. The juice is used as a diuretic, and for relieving asthmatic attacks, and when warmed and dropped into the ear, has been found to give great relief in earache.

Although by no means complete, this enumeration of the medicinal uses of leaves may be interesting in some quarters.

MINUTES OF THE PHARMACEUTICAL MEETING.

The meeting was called to order March 18, at 3.30P. M., and Mr. Robt. England was asked to preside. The minutes of the last meeting were read, and no corrections being called, they stand approved.

Specimens of *white turpentine* and *rosin* were presented by Mr. R. G. Dunwody, the beautiful quality of which was commented on; the rosin was in cubes of about an inch. In reply to a question whether it was put on the market in this shape, it was explained that from each lot of rosin, as run off into barrels, a quantity was run into a narrow trough of an inch depth and width, and this was broken into the small cubes as samples by which each lot could be sold.

Mr. G. E. Robeson, representing Dodge & Olcott, of New York, presented a specimen of "*Musc Baur*," an artificial substitute for musk with an odor of a very strong resemblance to that of the genuine article. The substitute is claimed to be three times as strong as grain musk.

Dr. C. B. Lowe presented two small oranges preserved in alcohol, known in Florida as *Kumkuats*. They are about the size of walnuts, and taste much like the larger fruit. They are used as a table decoration in some places.

Mr. Beringer exhibited some pieces of *porcelain apparatus*, made at the Royal Porcelain Works, in Berlin. It consists of a funnel with finely perforated diaphragm for filtering off liquids where it is desirable to preserve the precipitate. Another apparatus consists of a perforated plate with ring and cover, and in the side of the ring a perforation, to which the exhaust of a filter pump may be attached, so as to secure rapid filtration; to tighten the joints between the various pieces, a piece of dampened filter paper may be laid between the plates, thus forming a close joint.

Mr. Beringer exhibited a sample of *leaves of papaver somniferum*, which had been imported presumably for use in wrapping around opium after it had been partially deprived of its morphine. As opium must have a certain percentage of morphine to pass the Custom House inspection, it was thought that the opium, after being imported and partially exhausted, might be put up into balls with the poppy leaf wrappers, like the foreign opium; and it was stated that a Turk, skilled in the manipulation of opium, had been brought to this country. Prof. Maisch said that under former rulings of the Treasury Department, Persian opium was not permitted to be imported, except for the manufacture of morphine, and then under a bond that it should be so used; that variety of opium reaches our market packed in poppy trash, and not wrapped in poppy leaves and packed in rumex capsules, like the Smyrna opium. Boston or so-called pudding opium was stated to be quite common in the New England market, of definite quality, and is said to have been prepared at the suggestion of Boston importers, and made into small balls for convenience. Prof. Maisch exhibited from his cabinet some varieties of Constantinople opium in small balls about 2 to 5 ounces weight.

A paper upon *Tartaric Acid* was read by Mr. Fred. H. Smith, of the present class. Prof. Maisch read a letter from Mr. G. A. Krauss, giving some further information in addition to that contained in his thesis of 1889, upon *Villosin*, a product from *Rubus villosus*, discovered by him. Specimens of white crystallized villosin and villosic acid, made by Mr. Krauss, were also exhibited.

Mr. Dunwody read a paper on *Krameria.* Prof. Maisch asked whether the percentage of tannin found was not considerably lower than that previously determined by Wittstein. Prof. Trimble suggested that Wittstein may have had a fresher sample for his examination ; thus, geranium, while fresh, contained a larger percentage of tannin than after drying and when the tissues had become red. Mr. Beringer exhibited samples of the Brazilian and Peruvian krameria root examined by Mr. Dunwody ; the last-named sample, Prof. Maisch said, was less scaly, much thinner, but cleaner and of handsomer appearance than the commercial article of 25 or 30 years ago.

A paper upon *morphine salts and hydrocyanic acid* was read by Prof. Maisch, and several specimens of morphine solutions made in various ways were exhibited. The solution in distilled water, to which hydrocyanic acid had been added, remained clear ; likewise a solution in bitter almond water, the latter having been prepared by dissolving oil of bitter almond directly in water. Mr. Beringer showed a solution of morphine sulphate in imported *cherry laurel water,* which had deposited a crystalline sediment. On testing the cherry laurel water he had found it to contain magnesia and to yield, in the usual manner, a decided precipitate of ammonio-phosphate of magnesium ; the water sold as distilled cherry laurel water appears to have been made from the volatile oil by triturating it with magnesia and water.

A specimen of *Ceratum Plumbi subacetatis* was shown, and, in a note from Mr. Andrew Blair, it was stated, that if the solution of basic acetate were added to the melted fatty matters when barely fluid, the preparation would keep well, and not change color.

A paper upon Bacteria, by A. B. Stewart, Ph.G., was read and referred to the Publication Committee.

A paper upon *Phénol sodique* was read, showing that the solution made according to the formula published in the *National Formulary,* was much too strong to be used in the manner directed for the commercial phénol sodique. Mr. McIntyre said that a judicious name for this preparation was wanted. Dr. Lowe said it was a good dressing for wounds, promoting healing by first intention.

Mr. Beringer read a paper upon *tincture of musk,* contrasting the strength with that of the German pharmacopœia, and recommending diluted alcohol as a menstruum.

Prof. Maisch exhibited a number of very handsome and instructive *botanical models,* made by Robert Brendel, of Berlin, Germany, and imported by him last fall for illustrating his lectures. These models are made on a larger scale than those which he had used for the last fifteen years, and which had been made by the same firm. The models comprise flowers of nuphar, polygala, centaurea, taraxacum, sambucus, salvia, hyoscyamus, ricinus, humulus, juniperus, and others ; also, the yeast plant in various stages of development, a number of fungi, and transverse sections of six ovaries, showing the internal structure.

The various papers read were all referred to the Publication Committee. There being no further business the meeting adjourned.

T. S. WIEGAND, *Registrar.*

PHARMACEUTICAL COLLEGES AND ASSOCIATIONS.

The Connecticut Pharmaceutical Association held its fourteenth annual meeting in Danbury, February 4, President Stoughton in the Chair. The President delivered his annual address, and reports were received from the various officers and committees. The Association has a reserve fund of $1,100, with a membership of 267. During the past year, the Commissioners of Pharmacy had examined 71 candidates, of which number 32 had passed. Among the papers read was one *on maize oil*, by F. Wilcox, showing the oil to be well adapted for pharmaceutical purposes. Emil A. Gessner, New Haven, was elected President for the ensuing year; F. Wilcox, Waterbury, Secretary, and L. H. Goodwin, Hartford, Treasurer. The delegates to the pharmacopœial convention are W. A. Spalding, C. A. Rapelye and E. T. Vance. New Haven was selected as the place for holding the next annual meeting, the local Secretary being J. S. Coburn.

The Iowa Pharmaceutical Association met at its eleventh annual meeting in Des Moines, President Torbert presiding. Much of the time of the Association was occupied with discussions on reports of officers and committees relating to the sumptuary liquor laws as applying to the pharmacists. A resolution was adopted, recommending the appropriation by the Legislature of $3,000 for the Department of Pharmacy in the State University of Iowa. A paper *on ginger* was read by Prof. J. W. Culbertson. The officers for the current year are W. H. Torbert, Dubuque, President; Dr. Rosa Upson, Marshalltown, Secretary, and J. B. Webb, De Witt, Treasurer. The time and place of the next annual meeting will be announced by the executive committee.

The Washington Pharmaceutical Association was organized in the city of Tacoma, January 28. The draft of a pharmacy law was adopted and will be presented to the Legislature. The executive officers are A. C. Clark, Olympia, President; Walter S. John, Tacoma, Secretary, and S. F. Ramsey, Spokane Falls, Treasurer.

The Chicago College of Pharmacy closed its winter term with the commencement held in Hooley's Theatre, February 25. Addresses were made by Prof. W. C. Roberts, President of the Lake Forest University; by J. E. Sears and J. J. Wuerth. The recipient of the Biroth prize microscope was O. E. Paul. President Forsyth conferred the degree of Ph.G. upon the following candidates: Nathaniel H. Adams, Charles Albrecht, Charles M. Anderson, Merchant E. Austin, Carl W. Brinkhoff, Louis V. Bruns, Seth N. Dewey, Louis A. Druehl, Otto D. Ehrlicher, Bertie E. Fisk, Ed Fraser, Frank F. Fritz, William F. Froeschle, Henry E. Goldberger, William S. Haring, Emil A. Hartke, Dyar C. Hazelrigg, Henry Heine, Otto W. B. Henssler, Gustave C. Heppe, Frank C. Kellogg, Otto Klimmek, Melville C. Knapp, William G. Law, Oscar F. Lengacher, Oscar Lowenthal, Louis Marnitz, Henry C. Maurer, William F. O'Reilly, Otto E. Paul, James S. Rankin, Harold M. Rinehart, Parmer Rossman, Louis C. Schultz, John E. Sears, Benjamin R. Smith, Otto E. Stenicka, Pughsley S. A. Stewart, Charles F. Stockert, William H. Stolte, Charles A. Thayer, Albert Timke, Albert L. Tomlinson, William B. Tuteur, James K. Walton, John Woltze, John J. Wuerth, George Zoeller.

The Illinois College of Pharmacy had its commencement in the Grand Opera

House, Chicago, February 25, when 22 candidates received the diploma of that institution.

The Louisville College of Pharmacy had its graduating exercises at Macauley's Theatre, March 7, the number of graduates being 18.

EDITORIALS.

The Sixth Centenary of the University of Montpellier, France, will be celebrated during the latter part of May next. By virtue of a Bull of Pope Nicolas IV of October 26, 1289, a *Studium Generale* in the faculties of law, medicine and the arts was organized in the city named, so that the institution, during the past fall, entered upon the seventh century of its educational work, and the contemplated commemorative exercises will mark the close of the first year's session in the seventh century of the existence of this university, which now is a part of the Université de France.

Liquor Selling by Druggists in Pennsylvania.—The license law of this state, commonly known as the "Brooks' High License Law," contains the following relating to sales of liquor by druggists:

SEC. 16.—That Druggists and Apothecaries shall not be required to obtain license under the provisions of this Act, but they shall not sell intoxicating liquors except upon the written prescriptions of a regularly registered physician. Alcohol, however, or any preparation containing the same, may be sold for scientific, mechanical or medicinal purposes. Any one violating the provisions of this Act shall be guilty of a misdemeanor, and upon conviction thereof shall be subject to the same penalties as are provided in the fifteenth section of this Act.[1] Provided, that no spirituous, vinous, malt or brewed liquors shall be sold or furnished to any person more than once on any one prescription of a physician. And provided further, that any physician who shall wilfully prescribe any intoxicating liquors as a beverage to persons of known intemperate habits shall be guilty of a misdemeanor, and upon conviction thereof shall be subject to the penalties and fines as are prescribed in section seventeen.

Mr. Frank Prickett, of Rosemont, Montgomery County, who was recently convicted under the above clause, appealed the case to the Supreme Court, which affirmed the decision of the lower court. From the opinion by Judge Paxson, filed February 17, we quote the following:

"The defendant was sentenced to pay a fine of $500 and to undergo an imprisonment of three months in the county jail, under the first paragraph of the fifteenth section of the Act of 1887, which prescribes the punishment for selling liquor without a license, whereas he contends that his sentence should have been under the second paragraph of said section, which provides that 'Any person having license who shall be hereafter convicted of violating any of the provisions of the license laws shall be subject to a fine not less than $100, nor more than $500,' etc. It was contended that the defendant, being a druggist, must be treated as a licensed person, and for an unlawful sale must be punished, as before stated, under the second paragraph of section fifteen. But druggists, strictly speaking, are not licensed. They are not required to take out a license;

[1] A fine of not less than one nor more than five hundred dollars, and imprisonment not less than three nor more than twelve months, for the first offence.

they may sell in the manner indicated in the Act, and when charged with selling liquor unlawfully, can only defend by showing that the sale was upon a physician's prescription. . . The first count of the indictment distinctly charged him with the sale of liquor generally without a license. He was convicted upon this count, and we cannot assume, in the absence of the testimony, that he was convicted without evidence. In view of the manner in which the case is presented there is but one thing we can possibly do, and that is to affirm the judgment."

The Committee on Legislation and Trade Interests of the Pennsylvania Pharmaceutical Association has issued a circular notice of the above case, containing the following statements and advice :

Please remember that under the provisions of the section quoted you cannot sell

First—Any intoxicating liquors (and this includes Malt Whiskies,[1] and other intoxicants dexterously concealed under fancy and misleading names) except upon the written prescription of a regularly registered physician.

Second—Any Spirituous, Vinous, Malt or Brewed liquors to any person more than once on any one prescription.

Remember also that your Internal Revenue License, for which you pay twenty-five dollars ($25) annually does not in the least exempt you from the provisions of this state law, but has to be taken out for the privilege of selling alcohol.

In passing, we beg to urge upon you the importance of writing NOW, before this circular is laid aside, to your Member of Congress and urge him to use his influence to have this unjust tax upon druggists repealed at this session, when the subject is so prominently before that body.

It is due Mr. Prickett to add that from what we can learn of him he is a very reputable druggist, not a dram-seller, and doubtless brought this visitation of the law upon himself because he did not understand it, but this did not excuse him and will not excuse any druggist if brought in Court on similar charges.

Your Committee therefore desires to thoroughly acquaint you with the provisions of the law and bring to your notice the interpretation of its provisions by the Supreme Court of the State, believing that the information will be of interest and benefit to our members.

Criticising Physicians' Prescriptions.—A case of general interest to physicians and pharmacists came before the Court of Common Pleas, of Philadelphia, during the past month. It appears that a physician had written a prescription calling for Potass. bromide, 2 drachms ; Tinct. of Aconite root, 12 drops ; Spir. of Nitrous ether, 2 drachms ; Morphine Sulphate, 1½ grains ; Peppermint water, ½ oz., and syrup sufficient for 3 oz. Dose, 2 teaspoonfuls every 2 hours in water. The clerk receiving the prescription is stated to have refused to dispense it, remarking to the messenger that it would kill her, and afterward explaining in a note written by him that the ingredients were likely to produce an insoluble hydrobromate. The physician brought suit by capias against the proprietor of the store to recover $20,000 damages for the loss of his reputation as a careful physician. When the case came up, Judge Thayer, in deciding it, said that the plaintiff's affidavit, upon which the suit was based, did not allege that the druggist acted in bad faith in refusing to compound the

[1] We are informed that one of the sales made by Prickett upon which he was convicted was a bottle of Duffy's Malt Whisky.

prescription ; that a druggist is to be commended who is cautious in such matters, and that he is not liable in a suit for damages under the circumstances unless he acts maliciously. The Judge further said, there is no law which obliges a druggist to sell drugs to any man. The druggist was discharged on common bail, that is, on his own recognizance. We learn that the case will not be continued.

The above gives the legal aspect of this case. There is, however, also an ethical side to it. The action of the clerk, if correctly reported, was obviously, not only hasty, but quite discourteous. There is no need to point out to the experienced apothecary that there is no danger, arising from an insoluble precipitate, if the above prescription is carefully dispensed. But, even if the clerk's surmise had been correct, a different course of action would have been more becoming.

The American Medical Association will hold its forty-first annual meeting in the city of Nashville, commencing May 20, and steps have been taken for having in connection with the meeting an exhibition of pharmaceutic, surgical and sanitary products and appliances, the Chairman of the Committee being Dr. J. Berrien Lindsley. During the same week, the Tennessee Druggists' Association will hold its annual meeting likewise in Nashville.

Manufacture of Chloroform.—The following communication explains itself:

PHILADELPHIA, March 24, 1890.

To the Editor of the AMERICAN JOUR. OF PHARMACY :

DEAR SIR.—My attention has been called to the fact, that in my article on "Chloroform Manufacture" in the JOURNAL for July, 1889, I neglected to mention the article of Orndorff and Jessel (*Amer. Jour. Chem.*, Sept., 1888), on "the action of bleaching powder upon acetone," and so have done them an injustice in failing to accord priority of discovery to them. I am sorry this appearance of injustice was created by my article, as no slight was intended. They are, of course, entitled to the credit of first publishing an account of the chloroform producing reaction, based upon experimental work of their own. I made no attempt to claim anything as against them in my article. However, the reaction, exactly as I gave it, was known to both the manufacturers and myself, and had been discussed by us in connection with patent litigation, as early as March, 1888. So I did not think it necessary in my account of Roessler and Hasslacher's patents to go out of my way to speak of Orndorff and Jessel's study of the reaction. What I published on chloroform production, in July, 1889, I could just as well have published in March, 1888, except that litigation was still pending at that time. Very respectfully,

SAM'L P. SADTLER.

Diuretin, the sodio-salicylic compound of theobromine, is described as a white powder, containing 50 per cent. of theobromine, and dissolving in half its weight of hot water remaining in solution after cooling. Dr. Gram (*Lancet*, Jan. 4, 1890,) states that it produces strong diuretic action without affecting the central nervous system. It is given in gram doses.

REVIEWS AND BIBLIOGRAPHICAL NOTICES.

The National Medical Dictionary, including English, French, German, Italian and Latin technical terms used in medicine and the collateral sciences, and a series of tables of useful data. By John S. Billings, A.M., M.D., etc.; with the collaboration of W. O. Atwater, M.D., Frank Baker, M.D., S. M. Burnett, M.D., W. T. Councilman, M.D., Jas. M. Flint, M.D., J. A. Kidder, M.D., Wm. Lee, M.D., R. Lorini, M.D., Washington Matthews, M.D., H. C. Yarrow, M.D. Philadelphia: Lea Brothers & Co. 1890. 2 volumes, large 8vo, pp. xlvi, 731 and 799.

With the continually increasing interchange of the scientific literature of all nations, it becomes of the utmost importance to clearly comprehend the technical terms which are employed in the different languages. Those who read essays or larger works published in a foreign tongue often feel the need of a technological dictionary giving correct explanations of terms peculiar to that language. Such is the aim, applied to medicine and pharmacy, of the elaborate work now before us, which is intended to furnish to students and practitioners of medicine a clear and concise definition of every medical term in current use in English, French, German and Italian medical literature, including the Latin medical terminology of these languages. It will be observed that the work does not profess to include all the words that have been employed in medicine, but only such which are used at the present time. Obviously, there must be some difficulty to draw a line for the exclusion of words which are, at the present time, rarely used by medical writers. A number of such words, which, though considered obsolete, are liable to be occasionally met with in print, have been properly admitted; and in addition to these a few have also been taken to show what attempts at useless word-building may lead to. As a matter of course, the arrangement of the words is strictly alphabetical, without regard to the language to which they may belong. The French, German and Italian terms are defined by simply giving their English equivalents. Full explanations are given in connection with the Latin and English words, either one or both, and in this connection are also found the French, German and Italian synonyms, when these differ from the prime word. The pronunciation of the English and Latin terms is indicated by an accented syllable, and in addition to this a simple system of phonetic spelling has been adopted for those English words for whose proper pronunciation it was deemed useful. For most of the English and Anglicized Latin words, the derivation is given, with the exception of the names of drugs and plants. The total number of words and phrases defined is 84,844, of which 25,496 are Latin, 9,158 French, 16,708 German, and 6,514 Italian; but these figures do not include the foreign synonyms given only in connection with English or Latin primes. They indicate, however in a measure, the completeness of the work. It is scarcely necessary to refer to the correctness of the derivations and definitions given. The name of the learned author is sufficient guarantee for accuracy and reliability. Among the large number of terms which we have critically examined, we have observed one only which lacks somewhat—not in accuracy—but in that completeness which is characteristic of all the rest examined by us. Under Pennyroyal, the reference is, "see *Hedeoma*." To make it complete, the words "and *Pulegium*," or "and *Mentha Pulegium*," should be

added. In all other places where a reference to the plant named may be looked for, it will also be found.

The useful tables alluded to on the title-page comprise the following: 1, doses of medicines; 2, poisoning and antidotes; 3, numbering of spectacle glasses; 4, life tables; 5, relation of girth of chest to height; 6, dimensions of parts and organs of body; 7, weight of organs of human body; 8, dimensions and weights of fœtus; 9 and 10, graphic comparison of weights, measures and thermometric scales, and, finally, six tables of foods and dietaries, prepared by Prof. Atwater, and accompanied by two colored charts. The preliminary matter closes with a list of abbreviations used in the work.

The mechanical part of the book is in keeping with the excellence of the contents. Paper, typography, binding, etc., leave nothing to be desired.

The Paris Universal Exhibition. Pp. 76.

A reprint from the Pharmaceutical Journal and Transactions, giving a full and very interesting account of the raw material and products shown at the Exposition, held during the past year. In regard to the general character of these exhibits, the writer states that "there is little shown that can be described as sensational or novel. The exhibits are good—more, many of them are of great beauty and interest—but it can hardly be claimed that any very important advance in chemistry or pharmacy is here represented for the first time. Perhaps the most obvious impression that is borne in upon the mind of the observer is that the practitioner of old-fashioned galenical pharmacy is in France, as in other countries, fast superseded by the chemical manufacturer on the one hand and the medical confectioner on the other."

Laboratory Year-Book, 1890. By J. H. Appleton, A.M., Professor of Chemistry in Brown University, Providence, R. I. Gordon Roscoe & Co.

A little pamphlet of 31 pages (price, 12 cents), containing a few notes on work done during the past year and several useful tables.

Proceedings of the National Wholesale Druggists' Association, in convention at Indianapolis, October 22, 23, 24, 25, 1889. Minneapolis, 1890. Pp. 267.

The pamphlet is issued by the Secretary, Mr. A. B. Merriam, Minneapolis. Mr. Peter Van Schaack, Chicago, is the President for the current year.

Proceedings of the Michigan State Pharmaceutical Association at its Seventh Annual Meeting, held at Detroit, September 17, 18 and 19, 1889. Ann Arbor, 1890. 8vo. Pp. 149.

A number of valuable papers were read at this meeting, many of them on subjects investigated at the School of Pharmacy of the University of Michigan.

The officers for the current year are Frank Inglis, Detroit, President; H. J. Brown, Ann Arbor, Secretary; W. Dupont, Detroit, Treasurer, and D. E. Prall, Local Secretary. The next meeting will be held at Saginaw, September 16th.

Pharmaceutical Register of Victoria for 1889. Melbourne, 1890.

This Register is published annually, under the direction of the Pharmacy Board of Victoria.

Report of the Kansas State Board of Agriculture for the Quarter ending December 31, 1889. M. Mohler, Secretary, Topeka. Pp. 143 and 31.

Besides the statistical and meteorological information, the pamphlet contains interesting reports on the manufacture of sugar from sorghum and beet, and a

valuable report on smut in oats, and on the methods for preventing this disease.

Some Food Substitutes and Adulterants. By Edgar Richards, Washington, D. C. Pp. 18.

An address delivered by the President of the Chemical Society of Washington, January 23, 1890, and reprinted from Bulletin No. 5 of the Chemical Society of Washington.

The Nature of Amalgams. By Wm. L. Dudley, Salem, Mass., 1890.

An address delivered by the Vice-President of Section C of the American Association for the Advancement of Science, at Toronto, August, 1889, and reprinted from the Proceedings of the Association.

Bericht über die achte Versammlung der freien Vereinigung Bayerischer Vertreter der angewandten Chemie in Würzburg, 1889. Berlin. Julius Springer. 1889. Pp. 123.

Report on the Eighth Meeting of the Free Union of Bavarian Representatives of Applied Chemistry.

Of the papers read at this meeting, the following are especially mentioned here: On Sparkling Wines, On Carbonic Acid in Drinking Water, Determination of Lead in Tin Foil, Determination of Fermentative Power of Yeast, The Rancidity of Culinary Fats, and On the Examination of extracts of Meat; also, A Statistical Report on the Adulterations of Food Observed by the Members During the Preceding Year. The Publishing Committee consists of Prof. A. Hilger, Dr. E. List, Dr. R. Kayser and Th. Weigle.

Practical Electricity in Medicine and Surgery. By G. A. Liebig, Jr., Ph.D., assistant in electricity, Johns Hopkins University, etc., and George H. Rohe, M.D., Professor of obstetrics and hygiene, College of Physicians and Surgeons, Baltimore, etc. Profusely illustrated. Philadelphia and London: F. A. Davis. 1890. 8vo. Pp. viii and 383. Price, $2.

Of the three parts into which the volume is divided, Part I treats of electricity, magnetism, batteries, storage electricity and allied matters. The laws which underlie the practical application of these physical forces are fully discussed, special attention being given to the various forms of electrical and magnetic apparatus, which are likely to be of use to the physician. Necessarily the construction of the different batteries, the theory of the chemical action and the best methods of caring for the batteries claim much attention. Brief descriptions of the electric motor, the telephone and the phonograph are added not merely on account of their general interest, but because these appliances appear to be becoming of considerable value to the physician, both in the treatment and diagnosis of disease. The first chapter of Part II, entitled electro-physiology, treats of the effects of electric currents upon the healthy tissues and organs of the body, and is followed in chapter II, on electro-diagnosis, by the discussion of the modifications produced by disease, and of the methods for utilizing the same for purposes of diagnosis. The third chapter is descriptive of the most useful electro-medical apparatus, and serves as an excellent introduction to Part III, which considers the general therapeutic effects of electricity, the methods of application and the treatment of the diseases of the various organs by means of electricity. A number of useful tables are given in the appendix, mostly relating to current-strength, electro-motive force and resistance.

It was the aim of the authors to produce an intelligible account of the science of electricity and a trustworthy guide to its applications in the practice of medicine and surgery. In this endeavor they have well succeeded. The diction is clear and concise, always keeping the object in view. It is a practical and useful work, for which more than 250 illustrations have been judiciously selected.

The following pamphlets have been received:

The Cause of Death from Chloroform.—By H. C. Wood, M.D., and H. A, Hare, M.D.—Reprint from the Medical News.

Without special title, published by E. Merck, of Darmstadt, giving an account of recently introduced remedies.

Chloralamid.—A collection of papers by different authors on this new hypnotic.—Published by Lehn and Fink.

Twenty-ninth Annual Report of the Woman's Hospital of Philadelphia. January, 1890.

Seventh Annual Report of the Philadelphia Polyclinic and College for Graduates in Medicine. 1890.

Twentieth Annual Report of the State Board of Health of Massachusetts. Boston: 1889. 8vo. Pp. 325.

Among other matters of general interest this publication contains special reports on water supply and sewerage, on food and drug inspection, on the sale and use of opium in Massachusetts, etc. The last report states that 25 empirical preparations (patent medicines), reputed to contain opium, were analyzed, of which number one was found to be free from opium, two doubtful, two very slight or slight, while in the remaining twenty, opium was "present," seven containing "much."

OBITUARY.

Dr. George Kerner died in Frankfurt-on-the-Main, February 9th, at the age of 54 years. He was a pharmacist by profession, and studied chemistry under Fresenius, in Wiesbaden, remaining in the institution for some years as assistant. While here he made several elaborate investigations together with Prof. Neubauer on guanine, on urea and on the determination of chlorine in organic compounds. He then held, until a few years ago, the position of chemist in Zimmer's quinine manufactory near Frankfort, where he devoted his time chiefly to the perfection of the processes for the isolation of the cinchona alkaloids and for determining the purity of quinine. His essay on the latter subject resulting in the universally known "Kerner's Test," was republished in this journal in 1862, p. 517. Since that time several other papers from his pen on the same subject appeared in *Archiv der Pharmacie* and in *Berichte der Deutschen Chemischen Gesellschaft.* Among the apparatus which he improved or invented, the most ingenious is the kaleidostat for producing symmetrical ornamental patterns for paper printing.

George D. Rosengarten, the founder of the chemical manufacturing firm of Rosengarten & Sons, died in Philadelphia, March 18. He was born in Cassel, Germany, June 20, 1801, and came to America in 1819, and after travelling through the country settled in Philadelphia, in 1821, when, in partnership with Mr. Zeitler, he commenced the manufacture of chemicals, the latter retiring in

1823. In 1845, Mr. Rosengarten associated himself with N. F. Denis, the partnership lasting until 1855, when the firm was changed to Rosengarten & Sons. The factory was originally in St. John Street, afterwards at Arch and Twelfth, then at Broad and Vine, and in 1856, was removed to its present location at Seventeenth and Fitzwater Streets. During an active business life of nearly sixty years, the deceased, who retired from the firm in 1879, had the satisfaction of seeing the reputation of his firm continually increase with the growth of the country, and to reach far beyond its borders. He is survived by two daughters and five sons, four of whom are members of the firm and one an attorney-at-law. The sixth son, Adolph G., who had studied chemistry, fell as major at the head of his regiment at the Battle of Stone River, December, 1862. Mr. Rosengarten's wife died in 1886, having been married to the deceased in 1826.

VARIETIES.

Non-poisonous Solutions of Sublimate.—Under this name E. Salmon (*Medical Age*, 1889, 383) draws attention to solutions of corrosive sublimate containing emetics like sodium chloride, copper or cadmium sulphate, and in such quantity that a poisonous dose of the sublimate contains sufficient of the above salts to bring on emesis. The formulas proposed are:

	I.	II.	III.
Distilled water,	1000·0	1000·0	1000·0
Sodium chloride,	80·0	100·0	1·0
Cadmium sulphate,	0·5	—	—
Copper sulphate,	—	1·0	2·0
Tartaric acid,	—	5·0	—
Corrosive sublimate,	0·5	0·5	1·0

Amylene Hydrate is recommended in certain forms of epilepsy by Dr. Wildermuth, (*Therap. Monatsh.*, Dec., 1889). The dose varied from 1 to 4 gm., or from 3 to 8 gm. during the day. It is given dissolved in wine or cider. In some cases it produced drowsiness; but more frequently loss of appetite and various digestive disturbances were observed.

Guavin is the name of a resinous principle separated from the leaves of *Psidium pyriferum*, and for which Dr. L. Bertrand claims considerable value in intermittent fevers.

Administration of olive oil.—When giving olive oil in large doses of from 3 to 6 or 7 ounces in the treatment of gallstones, Dr. Rosenberg advises to combine it with 0·25 per cent. of menthol, 10 to 15 per cent. of brandy, and with two yolks to each dose as stated, which is to be taken in from 6 to 8 portions within 2 or three hours.—*Therap. Monatsh.*, Dec., 1889.

Paraldehyd has been successfully used by V. E. Ignatieff, (*Med. Obozr.*) in tetanus, the daily dose used internally and as clyster, varying from 3·75 to 9·5, and as high as 15 gm. No unpleasant secondary symptoms were observed, such as are frequently met with after large doses of chloral.—*Les Nouv. Remèdes*, 1890, p. 42.

Menthol has been used with good results in the vomiting of pregnancy. Dr. Weiss (*Therap. Monatsh.*, Jan., 1890) prescribes 1 gm. menthol, 20 alcohol and 30 syrup, and gives a teaspoonful every hour.

THE AMERICAN
JOURNAL OF PHARMACY.

MAY, 1890.

STANDARDIZED PREPARATIONS.

By H. H. Rusby, M. D.

In accordance with the kind invitation of the editor of this journal, and with the assurance that the discussion is to be conducted in a manner befitting the importance and dignity of the subject, I offer my last suggestions previous to the meeting of the Convention on the subject of the extension of standardization in the next edition of the *Pharmacopœia*, directing attention particularly to the effects of standardization upon the business of the retail pharmacist.

Such extension must depend upon the will of the physicians of the United States. Whether the conclusion is or is not satisfactory to anyone concerned, it is indisputable that if the physicians of the country desire standardized preparations, and anyone is ready to furnish such preparations, they will have them. The conclusion seems unavoidable that such is their desire. The use of standardized preparations is not an untried experiment. They have been used by many physicians with such satisfaction that there is a growing call for them, and we cannot escape the conviction that the demand will shortly become general. Just how strong is this feeling at the present time cannot be determined until the voice of the physician is heard upon the floor of the Convention. But if my impression is correct, then it can be set down as a fact that standardized preparations of such drugs as admit of standardization are going to be very generally prescribed before one-half of the next decade shall have passed away. If pharmacists do not blind themselves to this fact, they will be compelled to ask the question that naturally arises, "Shall we furnish these preparations?" What else, let us ask, can they do? Which way will their decision most certainly

work advantage to others and disadvantage to themselves; by taking the manufacture of such preparations out of the manufacturers' hands, or by deliberately refusing to do so? If there were anything in the past history of retail pharmacy which indicated a power on their part to determine the character of the medicines which physicians will use, then we might see some hope of their determining the action of the profession in the present instance. But who can deny that, willing or not willing, they must follow the direction of the medical profession. To me it seems that the gravest possible kind of a mistake will be made by the pharmaceutical profession if it shall pronounce a verdict not only contradictory to its high and just pretensions as a scientific body, but utterly useless for any other purpose than to cut its members off from participation in the benefits, professional and commercial, of a condition whose arrival cannot be stayed. How much better is it, accepting the inevitable, to take an honorable part in its promotion, and at the same time to so influence the movement as to make it tend, so far as possible, to their own best interests. As a matter of fact, the retail pharmacist ought to be the sole pecuniary gainer by the introduction of standardized medicines, and so he can be if he only will. Neither is there any doubt in my mind that there has been a general perversion of sentiment in favor of the very course that is most opposed to his interests, and against that which is calculated to most greatly benefit him. The committee on revision will surely be competent to decide how far the application of the principle is practicable.

Apparently there is at the present day little doubt that the weight of influence, in pharmacy as well as in medicine, lies in the direction of adding to the list of standardized drugs. It would appear that there is no doubt that this action will be taken by the Convention. But it is not so certain that pharmacists will favor the extension of standardization to any of the preparations. Here again much will depend upon the attitude of the medical profession. It is doubtful if they will be satisfied with the standardization of an article which they do not use, and the exclusion of the same principle from the preparation of it which they do use. If the standardization of the drug itself is a sufficient guarantee of uniformity in the preparations made therefrom to constitute practically the application of that principle to the preparations, then the formal standardization of such preparations is but a form, and the

credit therefor may as well be taken. But if upon the other hand, the standardization of the drug alone furnishes no guarantee of the uniformity of the preparations, and the latter must be taken solely upon trust, then it is certainly not a business-like proceeding, notwithstanding that we may entertain the utmost confidence in all parties concerned. Recently a number of very prominent writers upon this subject have offered the weighty argument that such of the ordinary color reactions, precipitation and other tests for active constituents as can be readily applied by the average pharmacist, are not sufficiently definite to exclude sophistication. Freely admitting some difficulty in this direction, the reply can still be made, that attempts at such sophistication are extremely unlikely to be made, however possible it might be to make them. The retail pharmacist, upon whom the responsibility rests, is certain not to do so, whether he manufacture his own preparations or whether he prefers to purchase them. If he purchase his preparations in original packages, then the jobber or wholesaler cannot tamper with them except under such risks as would not be taken once in a century; and no one who is familiar with the supersensitive pulse of the manufacturer can believe that he would dare venture upon such an attempt, the discovery of which—ultimately more or less certain —would not only impose legal penalties, but the destruction of his patronage.

Moreover, it is not true that this difficulty actually exists in the case of all active constituents. There are a number—and according to some authorities of unquestioned ability and experience, a considerable number—of them, the positive identification of which is sufficiently easy for the average pharmacist. Can we not with perfect confidence leave the investigation and decision of these questions to the ability and good judgment of the committee of revision, merely instructing them that it is the wish of the Convention that standardization should be extended to the preparations where it is in their opinion, admissible.

If, as it is to be hoped, such action shall be taken, the question as to what preparations shall be standardized is no less important. In the last number of the Pittsburgh *Medical Review*, the editor, than whom no more earnest and conscientious contributor is to be found in the land, argues that a new line of preparations should not be established, but that those already provided should be used for

this purpose. But the results of the action which he thus advises would be damaging. Aside from the danger of accidents resulting from the sudden substitution on the prescriptions of physicians, and unknown to many of them, of an article for which they have made no requisition, and in many cases very much stronger than they desired and expected, there is the objection that such action would impose upon pharmacists the worst form of the particular evils, with the smallest amount of the special benefits, which they are to experience as the result of the change. Suppose, for instance, that all the preparations of opium, or the most used of them, were to be placed under this rule. Then, wherever there was a pharmacist who was incompetent, or otherwise not in a position, to apply such a principle in his manufacturing operations, he would be absolutely compelled to purchase the whole of this class of products from the manufacturing houses. Just so far then, as the frequently asserted claim is true that pharmacists are not capable of doing this work, so far would the manufacturing business be taken away from him by the application of standardization to the preparations already provided. Probably during the first year or two no very large portion of the prescriptions sent him would be written with an intelligent desire for the application of the principle of standardization. The pharmacist would thus be put in a position of being compelled to do that which he claims is unprofitable and inconvenient, in advance of the intelligent action of the physician and in a way whose suddenness is calculated to do him the largest amount of harm. If, upon the other hand, a special preparation were provided to represent the standardization principle, then the appearance of such article in the physician's prescription would be a clear indication that such physician was expressing an intelligent wish for the application of that particular principle to his prescription, and no reasonable pharmacist would object to taking any steps necessary to satisfy the demand. If then, it were specially inconvenient for the pharmacist to manufacture such preparation at the time that the change went into operation, no interference to his business would be caused until time had been given him to gradually prepare himself for the change. His own ability and convenience would grow with the demand for the preparation, and everything of a radical nature in the proposed change would be eliminated. This increase in the number of preparations would not be permanent.

By the time that the next revision of the Pharmacopœia were made, the old fluid extract could simply be dropped and the new preparation, which would by that time have replaced it in actual practice, be substituted for it.

As regards a name for such a line of preparations, the question is too trivial a one to be publicly discussed. The committee of revision has always consisted of men thoroughly honorable and perfectly judicious, and they can be relied upon to select a fitting name.

The time preceding the meeting of the Convention is now very short, and it is most earnestly to be hoped that the conclusions of the delegates which shall be reached within the next week shall be the result of a broad and unbiassed consideration of the question.

THE STANDARDIZATION OF OFFICINAL DRUGS AND PREPARATIONS.—A PLEA FOR THE TRUTH.

By G. M. Beringer, Ph.G.

Read before the Philadelphia College of Pharmacy at the Pharmaceutical Meeting, April 22.

The standardizing of the drugs and preparations of the pharmacopœia is a subject which is now attracting a great deal of notice in the pharmaceutical press and which will undoubtedly claim the attention of the committee on revision. Unfortunately, the discussion has resulted in a mass of glittering generalities and harsh personalities have been indulged in to such an extent that there is danger of the vital points of the discussion being overlooked.

The standardizing of preparations would not prevent the dishonest dealer from selling goods below the standard. We have in our present pharmacopœia standards of purity for most chemicals, yet such articles as cream of tartar and precipitated sulphur are met with most grossly adulterated, and many of the commercial chemicals do not answer the officinal requirements. Has the assaying of opium prevented the dishonest druggist or wholesale manufacturer making láudanum below the officinal strength? Has there been any improvement in the quality of this article, as sold by the country store-keeper in bottles, since our Pharmacopœia introduced a method of opium assay? The term "country laudanum" is still applied by dealers in the article to a mixture containing a variable quantity of opium and a great deal of caramel and water. Standardization is not the panacea for this evil.

Here I would like to make a suggestion to the pharmaceutical associations. It has become customary for us to have a yearly report from a committee on adulterations, and these reports have been printed and given to the public as monumental proofs of the dishonesty of pharmacists. Instead of publishing such reports in future let the committee prosecute all cases where there is evidence of deliberate adulteration or falsification. Ten convictions would be a more wholesome lesson than ten thousand reports.

It behooves us to take a glance backward and see whether the methods of assaying organic drugs introduced in the last Pharmacopœia have met with anything like universal favor or adoption. The Pharmacopœia of 1880, introduced methods of assaying and fixed standards for such organic drugs as Cinchona, Opium and Pepsin. Have these been accepted as authority and generally adopted? The method of opium assay has been severely criticised, and it is doubtful if to-day a handful of chemists are following this method. Nearly every chemist who does much of this work has his own modification of Squibb's, Flückiger's or other proposed methods of assay. The introduction of the so-called strong pepsins necessitated some new method of assay. The officinal process for assaying saccharated pepsin was declared to be faulty, primarily because the results given were not high enough. To-day every manufacturer of this article is offering some modification of the pharmacopœial or national formulary test, especially devised to show the superiority of his product over that of competitors. Their sole idea appears to be, not to find the most accurate method, but to so alter the conditions as to obtain the greatest apparent digestive value.

These two cases serve but to illustrate the probable fate of methods of assay introduced in the Pharmacopœia. If any manufacturer desires for business purposes to show increased strength or value in a preparation, he will simply drop the officinal standard, puff himself and preparation through the advertising columns of the medical and pharmaceutical journals and circulars to physicians. The physician in search of a new lesson in materia medica seldom stops to inquire what are the officinal requirements; but, at the first opportunity prescribes Jones' Solution of Pepsin, or Liquor Ergotæ Dick's and obtains results identical with those he had previously obtained from the preparations of the neighboring pharmacist made in accordance with the officinal standard.

Even if it were possible to assay every organic drug and standardize every preparation, this would not remove the uncertainty in medicine. Physicians, as a rule, learn the uses of remedies and their doses methodically and he who could tell the percentage of alkaloid in extract of nux vomica or the amount of morphine he administers in a dose of tincture of opium is a rare exception. While the physician very properly demands exact remedies he is as a rule unable to define the limits of exactness required. Again, the observing physician carefully notes the peculiarities of his patients. In one patient quinine in small doses will produce a severe headache. In another, but small doses of belladonna or hyoscyamus will produce a very marked effect while in the next maximum doses may be necessary. So, then, the dose necessary in every individual patient, has to be carefully differentiated. A fact which the radical advocate of standardization seems to forget is that nature cannot be confined to a straight line that there is a certain amount of variation in individuals either organized or organic.

The respectable pharmacists of this country desire no looseness or indefiniteness in pharmacopœial preparations, and if any advance is made in this direction, you can rest assured that it will be the result of the labor of the pharmacist.

It might be asked, do the so-called active principles, alkaloids, glucosides, etc., represent the true medical action and value of drugs? If so, assays are a true measure of activity; if not, they are of questionable value. If so, the problem would be a very simple one, namely, in all cases prescribe the alkaloids. But the physician carefully differentiates between the cases in which he prefers nux vomica or strychnine, opium or morphine; and I have seen physicians who professed to obtain better results from fluid extract of cinchona than from the cinchona alkaloids.

By far the most important query, however, is: Is our knowledge of organic drugs and their constituents such, at the present time, as to enable us to chemically estimate their medical value?

The life history of but few medicinal plants has been satisfactorily studied. Of many we know nothing as to the variation due to collection at different seasons of the year. We know that colchicum is most active if collected while in flower or just after, yet it is generally collected several months before. It is pretty certain that podophyllum varies considerably at different seasons, and it is not

unlikely that the variability noted in gelsemium is due to the same cause. Of the effects of cultivation, altitude, climate, character of soil, etc., we as yet know but little. It is also pretty certain that drying and age alter materially the character of the active principles. Again our knowledge of the chemical nature of the active principles of most drugs is, at least, very uncertain, and in many we are as yet unable to decide, on what ingredient the activity depends; as for example cannabis indica. In ergot we cannot accept the alkaloids of Wenzell, Tanret and other investigators as representing the activity of the drug. In the great bone of the contention, however, the important solanaceous drugs we are confronted with a serious difficulty. Accepting the results of Ladenburg we find three alkaloids atropine, hyoscyamine and hyoscine, all having the same forumla $C_{17}H_{23}NO_3$, but these same alkaloids vary greatly physiologically. No process of assay such as could be made officinal would serve to separate the hyoscyamine from atropine in belladonna and stramonium or hyoscine from hyoscyamine in hyoscyamus. According to some recent investigations the alkaloid of belladonna is hyoscyamine which in the course of extraction is converted into atropine. Or what is probably true is that the composition varies with the age of the root or season when collected. There is yet room for a thorough scientific study of the subject. If these alkaloids existed in nature associated in a definite proportion an estimation of total alkaloids would be sufficient. In veratrum and digitalis we are confronted by analogous conditions. An assay under such circumstances can certainly be of little value in correcting the uncertainty of medical practice. While admitting the desirability of some method of determining the medical value of such powerful drugs an attempt to standardize such would result in making uncertainty more uncertain. Our foundation is too unstable to permit the rearing of a fine super-structure.

The alkaloidal principles are associated in drugs with other organic substances such as resin, coloring matter, tannin, vegetable acids, inert alkaloids, etc., and it is frequently difficult to separate the active principle in anything like a pure condition in a single operation. Frequently it requires several additional purifications before it can be satisfactorily determined. It certainly would be a serious error to estimate the percentage of alkaloid from the weight of crude residue obtained, yet this is recommended in some of the

processes published. Some few of the alkaloids of a decidedly basic nature can be estimated volumetrically by their saturating power with sulphuric or hydrochloric acids. The proposed methods of titrating with Mayer's reagent or with phosphotungstic solution are admittedly incorrect in many cases. An assay of aconite is likely to be falsified by the presence of napelline and other inert bitter principles, and the difficulty of obtaining the alkaloid in anything like a pure condition is proven by the experiments of C. R. A. Wright, Groves and other investigators. Again aconitine is very prone to change from exposure to heat or to treatment even with weak acids or alkalies to the amorphous aconine, of greatly reduced activity.

The analysis of organic drugs is a matter of great scientific value and interest, but we are compelled to admit that many of our processes of assay are faulty, admitting of but imperfect results, the principal value of which must be as a guide to the purchaser of lots of crude drug to enable him to decide approximately their value and freedom from inert material. When such a comparatively simple assay as that of opium will yield in different hands such results as reported by Teschemacher and Smith (*Chem. News*, 1888, 104), is it likely that assays of belladonna or aconite would yield results at all valuable? The writer would like to see a practical demonstration of this and would suggest that a good commercial lot of either of these drugs be procured by some uninterested expert, carefully powdered and mixed and samples distributed to say a dozen recognized analysts throughout various sections of the country, results to be reported to him at a fixed time. This would yield a valuable practical demonstration of the value of the pharmacopœial assaying and do more to satisfactorily settle the question than much talking. It is doubtful if a majority of the quinine experts of Europe would to-day agree upon the method of assaying and the purity of a sample of quinine salt.

The writer sees no good reason why nux vomica should not be required to contain a certain percentage of mixed alkaloids; as the total percentage of alkaloids here present brucine and strychnine does not vary greatly, and the physiological action of brucine is similar to but weaker than that of strychnine. Such drugs as cantharis, podophyllum, jalap and others will undoubtedly admit of assay. In many, perhaps, the quantity of extractive obtained with various solvents will be a valuable indication of purity.

Whatever the committee decide on, we hope will be the result of careful examination by competent unprejudiced investigations. Any processes adopted must be simple, requiring not too great an amount of time or expert knowledge and chemical skill to place them beyond the ability of the average pharmacist. The manufacturer, who has much assaying to do, will be compelled to engage a chemist, who will study up accurate methods of assay as the practical pharmacist studies the correct methods of manipulation. But the latter, with the multiplicity of details and customers claiming his attention, can not be expected to find time for exact investigations of the constituents of drugs.

The processes adopted must be practical and fairly accurate to ensure their general acceptance. We must not forget that our Pharmacopœia is intended as a guide and hand-book for the mass of pharmacists and not as a dictionary or encyclopædia for the expert.

As such, clearness and practicability are infinitely more valuable than absolute scientific accuracy. The danger of too radical changes can not be overestimated. Let us remember that our zeal should not outrun our discretion. There is no need of great haste, and every change should be thoroughly considered before the advance is made. "Truth is established by investigations and delay; falsehood prospers by precipitancy."

PHARMACOPŒIAL REVISION AND ASSAYS.[1]

By Dr. E. R. Squibb.

The directions for the description of crude drugs seem also to have been sufficient and satisfactory in the main, but in a few instances they do not seem to have been fully carried out by the Committee. This point may lead to discussion in the Committee, but probably not in the Convention.

The directions for the description of chemicals have of late excited much important discussion. It is directed that Opium and Cinchona shall have detailed processes of assay for the alkaloids, and that the minimum percentage of total alkaloids required be given under Cinchona, and the minimum and maximum of morphine in Opium be prescribed. No fault has been found with these direc-

[1] From the annual address of the retiring President of the Kings County Medical Association; reprinted from *Ephemeris*, April 1890, p. 1263.

tions, but it has often been claimed with much force, that now processes of assay should be directed for all the important crude drugs, even including those which have no definite, separable, active principles. This claim seems to be an outgrowth of experience obtained by the leading step taken in regard to Cinchona and Opium, but this is certainly not the case, for no one who has had much experience with Cinchona and Opium assays can have escaped the difficulties and uncertainties of these. The assaying of crude drugs for their active principles seems an easy matter to those who only read and write upon the subject. But those who attempt to practise the processes soon get a very different impression, for there is really nothing more precarious and uncertain than these assays in general hands with but a small experience in such work. Assay processes might perhaps be wisely directed for a few additional drugs such as Aconite, Belladonna, Conium, Hyoscyamus, Ipecacuanha, Jalap, Nux Vomica, Scammony and Veratrum Viride.

Pharmacopœial processes of assay will be successful or unsuccessful in proportion to their character. If they aim at a high degree of accuracy and precision they must, necessarily, be elaborate and complex to a degree that places them beyond the reach of general pharmaceutical ability. But if they aim at only the very moderate degree of accuracy, such as satisfies the careful manufacturer in the selection of materials, rough processes of approximate assay may be found that are sufficiently easy of application to be successfully applied to pharmaceutical ability and usage through the authority of the Pharmacopœia. While most of these rough and ready processes are secreted in the hands of manufacturers, yet enough of them are published to give the Pharmacopœia opportunities of selection in these, and in the trials of selection similar processes for all would be naturally reached. Including Cinchona and Opium eleven drugs have been named which might have processes of assay given in the Pharmacopœia, and if high degrees of accuracy be not aimed at, a moderate amount of work in the selection of proper menstrua would enable the Pharmacopœia to apply the shaking out process to all these articles with results sufficiently close for the present scope of the Pharmacopœia, and sufficient to prevent the Pharmacopœia from depending upon either experts, manufacturers, or commentaries. For example, a simple and easy process for Opium assay, which in hands of ordinarily educated pharmaceutical

skill and ability would have a maximum range of probable error of not more than a half of one per cent. above or below the truth—might be better adapted to the pharmacopœial usage of the present time, than a critically accurate chemical process with a range of error of a tenth of a per cent.—first because no two samples of the same lot of Opium, whether moist or in powder, would come within this small range of error; and next, because such a process would require a degree of expert knowledge and skill rarely found in pharmaceutical practice.

Another important consideration not to be overlooked is, that with the exceptions of Cinchona, Jalap, Opium and Scammony, the drugs named can always be bought by pharmacopœial description and tests, of such quality as to yield preparations of practically uniform therapeutic value. The claim frequently heard that all pharmaceutical preparations from crude drugs should be made or adjusted by assay is so plausible and attractive, as to form a most fertile basis for specious advertising by manufacturers of these preparations, and if the Pharmacopœia could be committed to this or any similar doctrine it would put much money into the pockets of large manufacturers, and just to that extent would divert practical pharmacy from its legitimate channels and proper responsibilities. In the first place, the claim is untrue and unfair because a very large proportion of important drugs have no separable active principle that can be determined by assay, and therefore their quality cannot be determined by assay, nor can their preparations be adjusted by assay. Out of some ninety officinal drugs in all, there are about thirty-four of the more important ones which may be fairly represented by Ergot, Rhubarb, Senna, Wild Cherry, Dandelion, Columbo, Gentian, Butternut, Pareira, Cotton Root, Cimicifuga, Buckthorn, Leptandra, Sarsaparilla, Spigelia and Stillingia, which could not be adjusted by any ordinary processes of assay, and which do not need it if they could, because care in buying them by pharmacopœial description and tests, rather than by price, will always easily obtain a uniform good quality, at moderate cost. Again, while a fair degree of accuracy and uniformity in the strength of galenical medicines is most desirable, any strain after a degree of accuracy that is not necessary, nor available if attained, is hurtful by whatever is sacrificed to attain it. In the therapeutic uses of medicines, doses are anything but definite or accurate in quantity.

Of the same medicines different individuals require different doses to yield the same effect. And even the same individual requires different quantities at different times and under differing conditions, and the real dose is that variable quantity that yields the peculiar effect of the agent. How then can the physician avail himself of any degree of critical accuracy beyond that practical uniformity of strength and quality upon which his experience is based, or any degree of critical accuracy which is beyond the limit of accuracy determined for him by variable individual susceptibility? All that is true and sound on this point is that a practical degree of uniformity is all that can be attained by the Pharmacopœia without any such system of elaborate assaying as would tend to throw this important interest of the Pharmacopœia into the hands of experts, or would-be experts. The line of wise action seems not difficult to draw here. If the descriptions and tests of the Pharmacopœia can be improved without carrying them beyond the reach of educated pharmaceutical or medical skill in application, this should be done, applying assay processes only to such drugs as have easily separable active principles. Then a a very few preparations, such as those of Opium, Nux Vomica, and perhaps Cinchona, might wisely have their strength adjusted by these assays. There has never been a time within the forty years' experience of the writer, when officinal drugs were more accessible to those who would take the trouble to look for them, and be willing to pay for them; and to those who will not take the proper pains, nor pay adequate prices, the Pharmacopœia would continue to appeal in vain, even by the most elaborate system of assays and adjustments, if such a system was practicable.

PHARMACOPŒIAL ASSAYS OF DRUGS AND GALENICALS.

By John M. Maisch.

Read before the Philadelphia College of Pharmacy at the Pharmaceutical Meeting, April 22.

Discussions on the standardization of drugs have of late years claimed much attention in medical and pharmaceutical literature. The object of the present paper is not to review the entire field covered by the arguments, but merely to present a few considerations, which have not heretofore been dwelled upon, or which, in the writer's opinion, have not received the consideration they deserve,

yet in view of the nearness of the pharmacopœial revision should be thoroughly examined and carefully weighed.

The unbiassed observer must acknowledge that the pharmacists, as a class, have honestly endeavored in the past to perfect the processes of the Pharmacopœia, and to render the galenical preparations as uniform in composition and as permanent as possible; the revisions of the National Pharmacopœia during the past fifty years bear ample testimony to this fact. Even processes of assay were introduced at the request of pharmacists. They made their appearance for the first time in a modest way in the Pharmacopœia of 1860, which required that "*Opium* (crude) should yield at least seven per cent. of morphia by the officinal (Staples') process;" and the quality of *scammony* was defined by requiring that "Ether dissolves at least 75 per cent. of it; and when the ether has been evaporated, the residue, dissolved in a hot solution of caustic potassa, is not precipitated by dilute sulphuric acid."

Both these processes are in consonance with the character of the Pharmacopœia as a law book; and in following them, the product obtained by the one could only consist of morphine contaminated with some narcotine; and the results of the other could only be due to scammony resin—provided that well-characterized opium and scammony had been subjected to the assays. In other words, the processes were in the main correct, but the Pharmacopœia had omitted to describe the material which should be subjected to these tests.

The Pharmacopœia of 1880 supplied this deficiency, and it has also improved the morphiometric test for opium. According to our present knowledge, opium as described by the Pharmacopœia, when examined by the process laid down by the same authority, yields as a final product the alkaloid morphine in a reasonable state of purity; no other alkaloid—at least none of those ordinarily occurring in drugs—can be present; the process is adapted for morphine, but for no other alkaloid.

The old process for the assay of scammony has been retained, and coupled with the pharmacopœial description of the drug, excludes other ether-soluble convolvulaceous resins, even orizabin (jalapin of authors) which has been shown to be chemically identical with scammonin. For the resin of the orizaba root cannot be manipulated so as to have the physical characteristics of the scam-

mony obtained by the spontaneous evaporation of the latex of the living scammony root.

In the two cases cited the requirements are clear and unmistakable, as a legal requirement should be, and it will be observed that such is also the case with the few other drugs for which processes of assay have been introduced into the last Pharmacopœia.

The officinal process for determining the digestive strength of *pepsin* may not be the best that can be devised; but in connection with the described physical characteristics identifies the article with sufficient exactness and establishes a minimum standard of quality which is perfectly reliable for the conditions given.

On assaying *cinchona* bark for total alkaloids by the pharmacopœial process, the resulting product consists of quinine, cinchonine and allied alkaloids, provided the identity of the bark as being derived from a species of Cinchona or of Remijia has been established; for by the same process a number of poisonous alkaloids may be prepared; and if, for instance, a strychnos bark (some of which are now met with in commerce) were tested in the same manner, strychnine and brucine would finally be weighed. It follows from this that, if cinchona bark or its powder had become accidentally mixed with strychnos bark, the alkaloids of the latter would be weighed as cinchona alkaloids. The same is also true of berberine, hydrastine, and some other non-poisonous alkaloids which are not freely soluble in a solution of sodium hydrate. The pharmacopœial estimation of *quinine*, which is based upon the sparing solubility of its sulphate in water, excludes all other alkaloids likely to be met with, even berberine sulphate being more freely soluble in neutral aqueous liquids; but if crystallizing, would reveal its presence by its yellow color. It will thus be seen that, while the pharmacopœial requirements for the percentage of quinine are, according to our present knowledge, sufficiently perfect as a legal standard, the assay for total alkaloids can be thus regarded only in connection with the absolute identity of the drug itself.

The remaining drug for which the present pharmacopœia prescribes a process of assay is *jalapa*, which is required to contain at least 12 per cent. of resin of which not over 10 per cent. (1·2 per cent. of the drug) should be soluble in ether. These requirements should be considered in connection with those given under *resina jalapæ*, excepting the faulty one with ammonia water, and are suffi-

cient to establish the identity and purity of the drug and the product obtained. Incidentally it may be remarked, that the German Pharmacopœia, which requires a minimum of only 10 per cent. of resin, will probably reduce the amount to 8 per cent., and the same may be necessary in this country, although it is well known that roots of much higher grade *may* be found. As it is likely that the subterraneous part of the plant will survive the winters in most sections of the Southern and Central United States, it is to be hoped that its cultivation, which appears to present no difficulties or unusual labor, may be undertaken, so that a supply of better quality of the drug may be regularly obtainable. In regard to the ether-soluble portion of the drug, it is well known that its percentage varies; but in the past experience of the writer, it rarely exceeds 10 per cent. of the total resin, and is mostly less than this amount. Since the water-soluble portion of the *alcoholic extract* of jalap possesses decidedly purgative properties, it may, however, be questioned whether an assay of the drug, based solely upon its resinous constituents can secure the absolute uniformity of other galenical preparations than the officinal resin, and it is obvious that for preparing the latter, a previous assay is not necessary.

In suggesting the standardization of other pharmacopœial drugs, writers have usually selected such which contain alkaloids, and for determining the percentage of the latter, recommended, in most cases, either the volumetric estimation of the liberated alkaloids by acids, or the employment of Mayer's solution. Though this test liquid is an excellent reagent for alkaloids, it cannot lay claim for giving unvarying results, since these are in many cases affected to a considerable extent by different degrees of dilution. And since its general behavior to all alkaloids is alike, the precipitates obtained with it from acidulated solutions merely prove the (probable) presence of alkaloid without identifying it. Such a process evidently lacks the first requisite of a legal requirement, definiteness; for pharmacopœial purposes it would be applicable only to the drug as there described, but not to the powder, tincture, extract or other galenical preparations.

But is there really such an urgent necessity, overpowering every other consideration, for requiring all drugs furnished by nature to contain a definite percentage or a minimum amount of a certain constituent, or mixture of constituents? This is extremely doubt-

ful for all those drugs which can be readily identified by their physical characters, and which have not been subjected to fraudulent manipulations. The three species of Cinchona formerly recognized by most pharmacopœias, viz: *C. Calisaya, C. succirubra* and *C. officinalis,* furnish unobjectionable bark for pharmaceutical purposes, and no assay—indispensable though it may be to the manufacturer of quinine—would be necessary for the uses of the physician or pharmacist; the introduction of barks, many of them of very poor quality, obtained from botanically allied trees, and possessing similar macroscopic characters, rendered the identification of the former doubtful, and chemistry was called upon to supply the needful means for determining the main constituents without regard to origin.

Why the quality of commercial jalap has deteriorated, is not known; possibly Prof. Flückiger's suggestion (see March number, p. 142) may be correct, and since the fraudulent manipulation (if the drug has been subjected to such) has been skilfully concealed, the necessity exists for the estimation of the remaining resin.

The milk juice of scammony root became adulterated in former years through the cupidity of the importer limiting the purchasing price to a figure below the cost of production, no less than through the cupidity of the producer.

Even at the present time we have no definite knowledge of the extent to which the composition of the pure milk juice of the poppy varies in the different districts of Asia Minor; but it is known that the opium from various localities may vary in morphine strength to the extent of several hundred per cent. Moreover, its original characters as an exudation are entirely obliterated by the manipulations it is subjected to before it enters the market; its physical characters approach those of the extracts, the external appearance of which is indicative of their remedial qualities only to a limited degree.

Now let us briefly consider one of the most powerful drugs of the Pharmacopœia, *nux vomica.* This seed is easily recognized, and its freedom from admixtures may be established without difficulty. It has been frequently the subject of chemical examination, and two of its powerful alkaloids, strychnine and brucine, are well known and are met with in commerce; yet the residuary products left in the manufacture of these commercial alkaloids, have never been satisfactorily

examined, although they have been shown to contain notable quantities of both strychnine and brucine; they still await researches similar to those made by Liebig and others, and later by O. Hesse, into the nature of the residuary products of quinine manufacture. But granting, for the sake of argument, that the two alkaloids named fairly represent the total alkaloidal constituents, it has been found that the total percentage of alkaloids varies in the commercial article generally between 2·5 and 3·5. In a sample of Bombay seeds, Dunstan and Short determined (*Year-book*, 1883, p. 235) 3 90 per cent., and in one specimen (*ibid.*, 1884, p. 463), taken directly from the fruit, 5·34 per cent. was obtained. Now, regarding the ordinarily best results with commercial samples (3·5 per cent.) as pure strychnine, one-twelfth grain of this alkaloid would be represented by 2·38 grains of nux vomica; or by double this amount (4¾ gr.) if strychnine be regarded as constituting one-half of the total alkaloids. All these quantities are within the limits of allowable large doses; but no prudent physician would *commence* with such doses of such a potent medicine.

There is still no process known by which strychnine may be absolutely and completely separated from the other strychnos alkaloids. Dragendorff (*Werthbestimmung*) regards the two principal alkaloids as being present in approximately equal proportion. Dunstan and Short (*loc. cit.* 1883, p. 469) have followed a method of separation which, in their hands, has given approximately correct results. On calculating the relative percentage of strychnine to the total alkaloids, as determined by them from commercial tinctures and extracts, it will be found to vary for the tinctures between 32·7 and 49·8 per cent., and for the extracts between 35·8 and 50·1 per cent., the extremes being in the proportion of 2 to somewhat over 3. It is known that brucine has an action, which is, qualitatively, very similar to that of strychnine, but quantitatively, differs very materially, according to Falck, being weaker in the proportion of 38·5 to 1. Calculating, upon this basis, the activity of brucine into strychnine, the latter would be represented, instead of the mixed alkaloids, by the figures 34·5 and 51·4, the proportion of the lowest and highest, or weakest and strongest being very nearly the same as before, 2 : 3. It is evident, therefore, that the determination of the total alkaloids will *not* secure the asserted uniformity; it will even not lessen the uncertainty to any appreciable degree.

The uncertainty would be considerably reduced, though not entirely removed, if an absolutely reliable assay of strychnine could be made; and until this is accomplished, physicians will have to continue to prescribe the alkaloid strychnine or one of its salts, if they aim at producing definite effects, which they believe not to be obtainable from nux vomica or its preparations owing to the inherent variation in their composition whether the drug be standardized for total alkaloids or not. There would be no harm done if the Pharmacopœia would require, say not less than 2·5 per cent. of total alkaloids; but the necessity for it is not apparent since it will be difficult to find in commerce nux vomica containing a decidedly smaller amount. It should also be stated in this connection that, in the writer's experience, the amount of strychnine obtained in the manufacture on a tolerably large scale, is usually considerably less than might be expected from the figures given above.

It seems unnecessary to enter in a similar manner into details with regard to other drugs containing alkaloids. When examined into without bias, it will be found that the different alkaloids present in the same drug, if qualitatively of the same action, usually differ considerably in their quantitative effects; that not unfrequently the qualitative effects of such alkaloids (for instance, in aconite, veratrum, etc.,) differ from one another very markedly; and that for both these reasons a knowledge of the total amount of alkaloids cannot give a correct idea—on the contrary, must be frequently misleading—as to the value of such an assayed product compared with the effects of its principal medicinal alkaloid in an isolated condition.

A practical difficulty for such assays on the scale required for the pharmacist consists in the correct sampling of the drug. Different specimens of aconite root, of nux vomica, of the narcotic leaves, etc., taken from the same parcel, will be found to give results differing more or less; and to preserve in several samples taken from the same lot, the relative proportions of old and young roots, or of rhizomes and rootlets will prove to be a most arduous task. In one essay giving an account of their excellent researches on nux vomica (*loc. cit.* 1884, p. 463), Dunstan and Short state that "the alkaloidal content of the seeds is directly as their size and inversely as their number in the fruit." These are conditions which pharmacopœial

requirements cannot influence, one way or another. It is obvious, then, that a correct and uniform sampling of such drugs can only be accomplished by grinding the parcel and mixing intimately—in other words, by destroying the physical identity of the drug.

Other difficulties might be mentioned, but in the writer's opinion, those cited appear to be the most prominent ones. Some excellent suggestions on this subject were presented to the British Pharmaceutical Conference in 1884, in two papers written by Mr. G. F. Schacht and by Mr. D. B. Dodd (*Year-book*, 1884, pp. 480, 485); they discuss in a clear and unimpassioned, but convincing manner the claims for standardization and some of the fallacies, and are in marked contrast to some papers which made their appearance more recently on this side of the Atlantic.

In the beginning of these remarks I stated that in the past, pharmacy had endeavored—I now add that she honestly continues in her endeavors to perfect pharmacopœial processes and to render galenicals as permanent and uniform as possible. To reach the theoretical perfection, a great deal of labor will have to be performed, and many intricate researches will have to be carried out to a successful issue, by physiologists, by therapeutists, by chemists and by pharmacists. In the meantime, ordinary prudence demands that a praiseworthy object should not be jeopardized by laying a treacherous foundation, and that the Pharmacopœia should not sanction processes which, in their results, do not and cannot prove that at which they aim, and consequently introduce uncertainties, and even sources of danger, equally great or greater than existed before.

In closing these remarks, I cannot more fittingly summarize them, than by quoting the conclusions arrived at, from a different starting point, by Mr. Schacht in the paper cited above: "Bodies of definite chemical composition and their dilutions are eligible for standardizing; but preparations of the nature of vegetable (drugs) infusions, tinctures, extracts, being for the most part mixtures of indefinite and unknown agencies, cannot be standardized without risk of misleading. Whenever any one of this latter class of bodies has been so studied that the remedial potencies and chemical properties of all its elements are declared by authority to be well known, that one passes from the latter class into the former."

ON A CRYSTALLINE PRINCIPLE FROM XANTHOXYLUM FRAXINEUM.[1]

By J. U. Lloyd.

As early as 1829[2] an analysis was made by Mr. Edward Staples of the bark of this shrub and a crystalline substance identified, to which he affixed the name *Xanthoxyline* (now Xanthoxyl*in*). Next, Dr. R. E. Griffith[3] refers to the shrub as a drug, and mentions this constituent. In 1876, I presented Prof. Maisch samples of a crystalline substance, obtained from the bark of the shrub, which, together with a brief description accompanying same, were presented to the college by Prof. Maisch at the pharmaceutical meeting, May, 1876.[4]

This is the record of the substance under consideration, so far as my knowledge can carry it, and it seems probable that your college specimen is the only considerable amount in existence, and possibly the only specimen purified since fifty years before, when Mr. Staples observed the crystals to which he referred. It will, I think, be evident to others who refer to my description of 1876 (as it is to myself), that the substance mentioned by Mr. Staples as crystals that separated from an evaporated tincture, were identical with the material I presented to Prof. Maisch, and that my work confirmed his statement.

Since it is evident to me that this body is of little if any medicinal value, it may be regretted that it should have been honored by so characteristic a name as xanthoxylin, although from a chemical view it may yet prove very interesting.

This body exists in the dried bark and is easily obtained, simply the act of extracting the plant with any solvent that will dissolve a fat, also removing it readily. Upon evaporation of the solvent, the substance crystallizes throughout the residual oily magma. Exposure to a low temperature facilitates its separation from the oleaginous companion, but even then considerable amounts remain in solution in the (often green) viscid fixed oil that is extracted from

[1] From a letter to Prof. Trimble, read at the Pharmaceutical Meeting, April 22.

[2] Am. Jour. Pharm., Oct., 1829, p. 163.

[3] Am. Jour. Pharm., 1837, viii, p. 195.

[4] Am. Jour. Pharm., 1876, p. 226.

the bark in considerable amounts by any menstruum that will dissolve the xanthoxylin. Repeated crystallizations from hot alcohol finally yield it white and in a state of purity. If desired it can then be obtained in large colorless needles, or it may be thrown down amorphous by adding cold water to its concentrated hot alcoholic solution.

Owing to the loss by the solvent action of the fixed oil that accompanies and holds much of it in solution I prefer to make it by the following method.

Exhaust the bark of Xanthoxylum fraxineum with alcohol. Distil the alcohol from the percolate, and wash the greasy residue with water. Mix a weak solution of caustic potash with the oily magma and stir until the oil is saponified. Separate the undissolved material by means of a muslin strainer (mostly xanthoxylin), wash it with water, dissolve it in boiling alcohol and cool. The crystals of xanthoxylin can be purified by recrystallization from hot alcohol. As before remarked, however, this substance dissolves in fat solvents, such as ether, benzol, etc., and any of these menstruums can be employed to extract it from the ground or powdered drug, and also to effect its subsequent purification.

Evidence that I accept as conclusive, instructs me that xanthoxylin is therapeutically inert. Like many similar crystalline bodies, (proximate plant constituents) it is of interest from a chemical rather than a medical stand, and the desirable constituents of xanthoxylum do not, in my opinion, embrace this seemingly characteristic body.

Chemical investigation may find a home for it among well-known classified bodies, thus rendering the name also inappropriate from structural relationships. That xanthoxylum bark contains substances of marked peculiarities and decided characteristics is evident, although these points were, of course, unknown to Mr. Staples. It is probable, I think, that the substance deserving the name xanthoxylin will prove to be amorphous, it may not be capable of isolation intact under present imperfect methods of manipulation, and yet that such a body exists those who have cause to work considerable amounts of the drug and are observing, have, I think, every reason to believe.

PRICKLY ASH BARK.

By E. G. Eberhardt, Ph.G.

Contribution from the Chemical Laboratory of the Philadelphia College of Pharmacy.—No. 71.

Read at the Pharmaceutical Meeting, April 22.

In the preceding paper attention is drawn by J. U. Lloyd to a crystalline principle obtained by himself and other investigators from the bark of Xanthoxylum fraxineum. In addition to the references there given I may state that this substance was subsequently observed also by Geo. H. Colton (Am. J. Pharm. 1880, p. 191) and Edward T. Moffit (ibid. 1886, p. 417). The latter obtained it from Xanthoxylum fraxineum and regarded it as identical with that observed by Lloyd and Colton. Mr. Colton operating upon the bark of Xanthoxylum carolinianum obtained it from the petroleum ether extract and describes as follows: "These crystals . . . were obtained in tasteless, colorless, silky needles, readily soluble in alcohol, ether and chloroform, less soluble in benzin, insoluble in boiling water or solution of potassa. When heated on platinum foil they fused and burned with a smoky flame. Gently heated on paper the substance fuses to a transparent resinous mass, which dissolves in alcohol and can be obtained in crystals on evaporation of the solution"

PRINCIPLE FROM XANTHOXYLUM CAROLINIANUM.

In order to further investigate the substance a quantity of the bark of Xanthoxylum carolinianum, furnished by Eli Lilly & Co., of Indianapolis, and obtained by them directly from their source of supply in the south, was exhausted with petroleum benzin, the solvent recovered by distillation in vacuum and the residual oily liquid set aside for the crystals to form. These were finally collected and recrystallized from alcohol until nearly colorless. They melted at 119° C., and a preliminary combustion of ·2228 gm. yielded ·5511 gm. of CO_2 and ·1108 gm. of H_2O; equivalent to 67·46 per cent. of carbon, 5·52 per cent. of hydrogen and, in the absence of nitrogen, 27·02 per cent. of oxygen.

The crystals were now further purified by treatment with animal charcoal and recrystallization from hot alcohol. By this means they were obtained in colorless, silky needles, tasteless, but slightly bitter in alcoholic solution, soluble in alcohol, ether, chloro-

form, very sparingly in benzin, insoluble in cold, but slightly so in boiling water. On adding a few drops of the alcoholic solution to water a turbidity was produced which disappeared on heating and reappeared on cooling, the substance separating after some hours in crystalline flocculi.

Concentrated sulphuric acid dissolved it with a dark red color, forming on dilution with water a purplish precipitate which was not taken up by chloroform.

Strong nitric acid dissolved it with a yellow color which changed to red on heating with evolution of red fumes of NO_2. The addition of an excess of water now produced a small amount of a yellowish-white precipitate, which with aqueous alkalies gave no color at first, but gradually dissolved turning red after some time.

In alcoholic solution the substance gave no reaction with ferric chloride. It was not dissolved by hot aqueous alkalies. It melted at 119° C., remaining after melting as an amorphous, transparent resin. Glacial acetic acid dissolved it very readily on warming, and subsequent dilution precipitated it unchanged. Digestion with dilute hydrochloric acid produced nothing capable of reducing alkaline copper solution. It burned with a smoky flame giving an aromatic odor slightly suggestive of coumarin.

Dry chlorine gas passed into the ethereal solution produced no precipitate. Evaporation of the ether left a soft amorphous residue insoluble in water, sparingly soluble in cold, more readily in hot alcohol, separating on cooling in amorphous, flocculent masses which on drying left a brittle resin melting to a thick viscid liquid at 90° to 95° C. The solution after heating with alkalies and saturating with nitric acid gave a precipitate of Ag Cl with silver nitrate.

A number of combustions were made with the following results:

I,	·1441	gm.	substance	yielded	·3281	gm.	CO_2	and ·0676	gm. H_2O.
II,	·1151	"	"		·2864	"	"	·0541	" "
III,	·1212	"	"		·3005	"	"	·0585	" "

Calculated to percentages this gave

	I.	II.	III.
C, ...	67·73	67·86	67·62
H, ...	5·21	5·22	5·36
O, ...	27·06	26·92	27·02

	Average.	Calculated for ($C_{20}H_{19}O_6$).	Calculated for ($C_{30}H_{28}O_9$).
C,	67·74	67·63	67·67
H,	5·26	5·35	5·26
O,	27·00	27·02	27·07

This still left some doubt as to the formula, but as the amount of substance obtained was small, further experiments had to be postponed for the present. There can be no doubt that this substance is identical with that obtained by Colton.

PRINCIPLE FROM XANTHOXYLUM FRAXINEUM (LLOYD'S).

Comparison of the above-described substance with that presented by Lloyd (AM. J. PHARM., 1876, p. 226) and preserved in the museum of the college, disclosed a radical difference in crystalline form. Of the latter there were two specimens, one in comparatively large, somewhat tabular crystals, resembling in a measure potassium chlorate; the other, in the form of a light crystalline powder, identical with, but less pure than, the first, as was found upon further investigation.

A portion of the crystallized sample was further purified by the means above employed, *i. e.*, treatment with animal charcoal and recrystallization from hot alcohol. It was thus obtained in colorless crystals, smaller but of the same character as in the original sample, soluble in ether, chloroform and glacial acetic acid, from which it crystallized unchanged, insoluble in water or cold aqueous alkalies. Boiling aqueous alkalies decomposed it, dissolving it with a yellow color and saturation of this solution with dilute acid precipitated it as a light brown amorphous powder. In substance it is tasteless, but in alcoholic solution bitter and somewhat pungent. Digestion with dilute hydrochloric acid did not decompose it.

Concentrated sulphuric acid dissolved it with a light red color, appearing greenish-yellow in very thin layers. The addition of an excess of water to this solution produced a whitish precipitate which was taken up by chloroform and left as an amorphous residue upon evaporation of the solvent.

Strong nitric acid dissolved it with a deep red color and on dilution a bulky yellow precipitate was produced, soluble in alcohol, ether and chloroform, slightly soluble in water and easily in aqueous alkalies, forming blood-red solutions.

Dry chlorine gas passed into the ethereal solution precipitated a white crystalline powder, sparingly soluble in alcohol or ether.

Fusion with caustic potassa yielded formic, acetic, butyric and probably all the acids of the series as far as caproic. None of the aromatic class of bodies could be identified among the products.

The substance melted at 129·5° C. and resolidified to a crystalline mass at 123° to 125° C.

Combustion gave the following results:

I, ·1542 gm. of substance yielded ·3931 gm. CO_2 and ·0744 gm. H_2O.
II, ·2697 " " " ·6855 " " ·1279 " "
III, ·1186 " " " ·3010 " " ·0572 " "

In percentages:

	I.	II.	III.
C,	69·17	69·32	69·21
H,	5·36	5·27	5·36
O,	25·47	25·41	25·43

	Average.	Calculated for ($C_{29}H_{27}O_8$).
C,	69·23	69·18
H,	5·33	5·37
O,	25·44	25·45
	100·00	100·00

CHLORINE-DERIVATIVE.

Several grams of the purified crystals were dissolved in ether and dry chlorine gas passed into the solution until precipitation ceased. The crystalline powder so obtained was thoroughly washed with alcohol to free it from adherent chlorine and carefully dried over sulphuric acid. The ethereal liquid was shaken with water which after separation was found to contain hydrochloric acid. The ether on evaporation left a small amount of an amorphous residue which by treatment with alcohol yielded more of the crystalline product. The latter melted at 169·5° C., with evolution of hydrochloric acid.

To estimate the chlorine ·4524 gm. of substance was heated with pure calcium carbonate in a tube, dissolved in dilute nitric acid and precipitated with silver nitrate. This yielded ·4871 gm. of AgCl, equivalent to 26·63 per cent. of chlorine. Assuming that chlorine replaces an equal number of hydrogen atoms in the formula ($C_{29}H_{27}O_8$) this would indicate the replacement of five atoms (calculated 26·27 per cent. of Cl). To prove the correctness of this result a second estimation was made using sodium carbonate. ·3464 gm.

of substance yielded ·4127 gm. of AgCl equivalent to 26·59 per cent. of Cl.

NITRO-COMPOUND.

A portion of the substance was dissolved in strong nitric acid, taking care to prevent an undue rise of temperature, and the solution poured, while stirring, into an excess of water. The bulky, yellow precipitate so obtained was collected and washed with distilled water until but faintly acid, dissolved in dilute sodium hydrate solution, again liberated by saturation with dilute hydrochloric acid and shaken out with ether. Upon evaporation of the solvent it was left as an amorphous brown residue which was dried over sulphuric acid. The substance had no definite melting-point, but softened at about 85° C, and began to decompose above 100° C. It was somewhat hygroscopic and difficult to obtain completely dry. An estimation of nitrogen by Varrentrapp and Will's method yielded from ·3044 gm. of substance ·01501 of NH_3, equivalent to 4·06 per cent. of nitrogen. After drying for several hours at 70° C., ·3038 gm. yielded ·01673 of NH_3 or 4·53 per cent. of N.

A fresh portion of the original substance, heated with nitric acid and precipitated as before, gave a product of a brown color. After purification ·2513 gm. of this yielded ·01329 of NH_3 or 4 35 per cent. of N.

The percentage of nitrogen required for the formula $C_{29}H_{25}(NO_2)_2O_8$ is 4·73. It is, however, highly probable, more especially in the last instance, that the substance was otherwise oxidized and rendered to some extent acid in character.

CONCLUSION.

It appears then that the two substances obtained respectively from the northern and southern variety of prickly ash bark are not identical. They are probably allied compounds differing in constitution. By the use of Lloyd's process of preparation the same substance was obtained from Xanthox. carolinianum that had previously been obtained by the use of benzin. The northern variety could not be obtained in time to embody the results of its investigation in this paper, but further research upon this and also the alkaloid of prickly ash bark is in progress.

NOTE.—Since the above was written the bark of X. fraxineum has been under treatment and work has sufficiently progressed to prove

the identity of the crystalline principle extracted by petroleum ether with that obtained by Lloyd from the same species. They are alike in chemical and physical properties. Combustions of the last substance have as yet not been made. It was also noticed that the northern bark contains its peculiar principle much more abundantly than the southern.

The fixed oil obtained appears to be a sulphurated compound. A portion saponified with KOH and subsequently acidified with dilute HCl gave decided evidence of H_2S. Nitric acid acts energetically upon the oil, producing elaidin. The aqueous and acid filtrate from this gives a precipitate with barium chloride insoluble in nitric or hydrochloric acids.

TANNIN OF QUERCUS ALBA.[1]

By Henry Kraemer, Ph.G.

One of the most abundant and interesting principles, produced during the life of numerous trees and herbs, and more especially in the barks and leaves of such, is a vegetable acid of astringent taste, giving blue or green compounds with salts of iron and by reason of its use, from many sources, in the process of making leather is called "tannin." The constitution of but one tannin, that of nut-galls is thus far understood. There are nevertheless several important classes of tannins recognized, based upon derivatives obtained from them; those which yield on dry sublimation either pyrogallic or pyrocatechuic acids; and those giving upon fusion with potassium hydroxide either protocatechuic acid or phloroglucol. Upon the suggestion of Prof. John M. Maisch, I have undertaken the study of the tannin of our officinal "White Oak Bark;" and to him I am indebted for references and many valuable suggestions in this work.

The preparation of a pure tannin is attended with considerable difficulty. The process which was found most practicable, was to macerate about 2½ kilos of Quercus alba with 95 per cent. of alcohol for a few days; then to pack in a percolator and allow per-

[1] This paper is an abstract of the chemical work reported in the author's thesis a year ago, to which, at the editor's request, some investigations more recently made have been added. The histological work, reported in the author's thesis, has not yet been arranged for publication.—Editor Amer. Jour. Phar.

colation to proceed only so long as the percolate showed a deep red-brown color. This concentrated alcoholic solution was distilled under reduced pressure to a volume of about 250 cc., the alcohol being further removed over sulphuric acid in a vacuum desiccator. This extract was then dissolved in tepid water and the solution filtered from a reddish-brown substance which remained undissolved ; (but which redissolved readily in sodium hydrate or in alcohol) while to the filtrate additional water was added until no further precipitation occurred. The solution was again filtered and when perfectly clear surrounded with ice ; when there separated an additional amount of the same reddish-brown substance as before and which indeed it is difficult to remove. The tannin was now precipitated from solution by means of sodium chloride. In previous experiments it was found that the amount of salt required to saturate the tannin solution was 0·3512 gm. for 1 cc. The sodium chloride, previously calculated, was divided into five equal parts and added in separate portions, slowly but with constant stirring to the solution, which was surrounded by a freezing mixture. In this manner five fractions of tannin were obtained. The original aqueous solution, before addition of sodium chloride, was of a dark red color as was also the first fraction of tannin. The solution as well as the succeeding fractions of tannin became lighter in color, the last being of a yellow color. Each one of the precipitated tannins was now separately dissolved in tepid water ; filtered from some of the same reddish-brown substance as observed before, and water was added until precipitation ceased. The solutions were filtered and the tannins again precipitated with sodium chloride, but were immediately taken up by means of acetic ether. Between the aqueous and ethereal solutions there was suspended some of the same reddish-brown substance, a part of which adhered to the sides of the separatory funnel. The acetic ether was removed from the tannins in a vacuum desiccator over sulphuric acid. They were again separately taken up with tepid water and additional water added as before ; also extracted with acetic ether and the ether removed as previously. By these repeated methods of purification five pure, though small, fractions of tannin were obtained. All of them at first dissolved in warm water, but in a short time, they all showed signs of having undergone more or less decomposition. The combustions made of the separate fractions showed considerable

variation, but the two fractions of which duplicates were made and which agreed most closely, gave of

C,	58·74	59·65
H,	4·50	4·65
O,	36·76	35·70

These results correspond approximately to the formula $C_{29}H_{27}O_{13}$. Owing to this instability of the tannin of Quercus alba, it will be apparent that the results of combustions must vary and be rather unsatisfactory. In arriving at the constitution of this tannin, the solution probably lies in preparing acetyl or benzoyl derivatives and other stable compounds with it, some of which I hope shortly to be able to prepare.

The derivatives of this tannin are interesting, as they are not pyrogallic acid or phloroglucin, and hardly pyrocatechin or protocatechuic acid. A portion of the tannin was heated between two watch crystals, when a carbonized and tasteless mass remained; while upon the upper crystal there sublimed in needle-like crystals a light yellow compound, but sparingly soluble in water, the solution having a blue fluorescence; readily soluble in alcohol and in potassium hydrate, producing with the latter a red color which possessed an evanescent blue fluorescence. It resembled pyrocatechuic acid, in that it gave a dark green color with ferric chloride, which is turned slightly red by potassium hydrate and by hydrochloric acid the green is restored. It differs from this acid, in that it does not give a violet color to fir-wood, moistened with hydrochloric acid; also in that with calcium hydrate it produces a yellow color by transmitted light and a blue color by reflected light. In nitric acid it dissolves with a yellowish-red color, becoming deep red on addition of potassium hydrate.

Another portion was heated with nearly an equal weight of potassium hydrate in a silver crucible to a uniform state of fusion. The residue was dissolved in water, acidified with hydrochloric acid and then shaken with ether and the ethereal solution evaporated nearly to dryness. The result was a reddish-brown amorphous substance, producing a dirty mixture with water, and upon the addition of alkalies changing to a clear red solution, with a slight blue fluorescence. With ferric chloride it produced like protocatechuic acid a dark green color, which, upon addition of potassium hydrate, was immediately changed to a bright red color, but differed from this

acid in that this color was replaced by a yellow upon the addition of hydrochloric acid. A portion of the mass remaining from the ethereal solution deposited a slightly yellowish amorphous substance upon sublimation, producing with ferric chloride a deep red color. Another portion with ferric chloride gave a green color, which immediately changed to a yellowish-brown upon the addition of sodium bicarbonate, having a blue fluorescence.

A third portion of the tannin was heated at 100° C, with a 1 per cent. solution of hydrochloric acid for six hours in a sealed tube. A reddish-brown scaly substance separated (soluble in alkalies and in alcohol). The filtered clear yellow solution had a slight blue fluorescence. It was shaken up with ether and the ether removed by spontaneous evaporation. A light yellowish amorphous substance remained, having a bark-like odor, producing with sulphuric acid a greenish-yellow color, which became red upon warming, and on the addition of sodium hydrate, the color disappeared, but reappeared on adding a slight excess of alkali. If ammonia be used in this test, in addition to the above color, a decided fluorescence is observed. The aqueous solution was now deprived of ether by boiling, and then treated with Fehling's solution, which was reduced. A portion also gave with ferric chloride an olive green color; with acetate of lead a flocculent precipitate; with sodium hydrate a red brown color by transmitted light and a blue by reflected light.

The aqueous solution of the tannin of Quercus alba is light yellow in color; reddens blue litmus and gives also the following reactions:

With Fe_2Cl_6, an olive brown color possessing a slight fluorescence; in strong solutions a dark olive brown precipitate.
With alkalies, a deep red color, having also a decided blue fluorescence.
With $Pb(C_2H_3O_2)_2$, a flocculent precipitate (hardly white).
With $K_6Fe_2(CN)_{12} + NH_3$, a deep red color.
With $AgNO_3$, on application of heat, a reduction of metallic silver.
With Fehling's solution, on application of heat, a reduction of metallic copper.
With uranium acetate, a red brown precipitate, redissolving in acetic acid.

From these observations it will be seen that the tannin of Quercus alba yields upon sublimation a crystalline principle resembling somewhat pyrocatechin. Upon atmospheric oxidation it gives the insoluble red or phlobaphene; and upon fusing some of the tannin with potassium hydrate gives a phenol similar to protocatechuic acid.

The alkaline solutions of the tannin upon certain conditions possess a blue fluorescence. This fluorescent principle was per-

ceptibly present in the largest amount in bark recently collected, and but sparingly in many of the older commercial barks. That the material used in this research was undoubtedly that of the inner bark of Quercus alba, I feel quite sure of as this same reaction was observed in bark obtained in quantity from a reliable source and also in that collected by myself. Whether this fluorescence is a character of the tannin or a decomposition product of it, cannot from present work be accurately stated, and it is useless to fill up the gap by mere speculation; but given some time I hope to be able to throw some light upon the constitution and nature of this tannin.

ON THE PRESENCE OF KINIC ACID IN THE LEAVES OF THE AMERICAN CRANBERRY (VACCINIUM MACROCARPON, *AITON*).

By Edo Claassen.

In Vol. 58, page 322, of this journal, it was stated that a calcium precipitate, prepared from the above leaves, was preserved for further examination in regard to the presence in it of kinic acid, and in the same volume also, on page 325, there was announced the preparation from this precipitate of a calcium salt in beautiful 6-sided plates. After having been prevented for a long time to continue the examination of these crystals, I could now commence the same again and consider their shape as well as their composition (*i. e.*, the amount in them of water and calcium)—and also their properties when treated by heat. As was already mentioned above, the crystals in question presented themselves as 6-sided plates, showing in their appearance no difference whatever from the forms of the calcium kinate, which are described to consist either of a combination of the much predominant basal plane o P with the orthorhombic prism ∞ P, or, as in this case, of the same combination and the planes $\infty \breve{P} \infty$, the last ones of course truncating the acute angles of the prisms, thus forming 6-sided plates, which are bounded by the same planes and have accordingly the same appearance like the crystals on hand.

The examination of these crystals in regard to their amount of water and calcium was then done as described below. Before entering, however, into any particulars, it may be stated that the crystals were kept for three years in a paper box and in a dry place, and consequently did have the best opportunity to lose some

water if liable to do so. It is a well-known fact, certainly, that calcium kinate crystals are efflorescent in dry air, as also that they are deprived of all their water—after having been exposed—for a sufficient time to a heat of 120° C., and, moreover, that a heat even of 200° C. will not decompose them. Considering this, 0·6132 grm. of the crystals to be examined were dried at 150° C., at which temperature they lost 0·1091 grm., representing the amount of water present, and left a residue of 0·5041 grm., the anhydrous calcium salt, without apparent change; this residue, ignited until perfectly white again, and then repeatedly and carefully heated with some water and ammonium carbonate, left 0·1191 grm. of calcium carbonate, corresponding to 0·0476 grm. of calcium. According to the above statement, the quantity of water of crystallization present amounted to 17·808 per cent., and that of calcium in the anhydrous salt to 9·451 per cent., while it is known that calcium kinate contains 29·900 per cent. water and the anhydrous salt 9·479 per cent. calcium. The analyzed salt lacks, therefore, considerably in regard to the amount of water, viz: 12·082 per cent., which loss may be easily explained by its having been exposed for the mentioned long time to dry air—and is, anyhow, in this case—of no importance, if it should not be claimed as a proof that the calcium salt in question is also possessed, like the kinate, of the property of efflorescing in dry air. In regard to the amount of calcium, however, in the anhydrous salt, it is of interest to note that there is hardly a difference existing between the quantity found in it and that calculated from pure calcium kinate, which difference, being but 0·028 per cent., is evidently not sufficient to raise any doubts as to the identity of that salt with calcium kinate.

Although, after having arrived at this point, a further test did not seem to be of value any more or necessary; it was resolved to continue the examination, in order to add to the chain of proofs the last link, if such one might possibly be thought by somebody to be yet missing. For this purpose I prepared from pure kinic acid some calcium kinate, with which I then made the following test, comparing the same carefully with reactions obtained under the same conditions, with an equal quantity of the calcium salt from Vaccinium macrocarpon, *Aiton*. The pure calcium kinate gave, heated in a tube, much water, then melted by increased heat,

swelled up considerably, and turned dark and grayish black, evolving fumes of a strong smell, which partly were condensed with the water, and thereby caused the same to acquire an acid reaction, a pungent taste and a brownish-yellow color. The salt in question was then subjected to the same test; the result was exactly the same. Further experiments, such as the preparation of kinone, were consequently now deemed entirely unnecessary for the corroboration of the fact, that the leaves of Vaccinium macrocarpon, *Aiton*, contain kinic acid.

RESIN OF PODOPHYLLUM AND PODOPHYLLIN.

By J. U. Lloyd, Cincinnati.

Discovery.—As early as 1831[1] Mr. Wm. Hodgson made a partial analysis of the rhizoma of podophyllum, but overlooked the resin. In 1846[2] Dr. John King described a resinous substance then employed in his practice, identifying it as follows: "I obtain only the resin, by extracting all that alcohol will take up (by tincturing the drug), then filter the alcoholic tincture, to which add an equal quantity of water, and separate the alcohol by distillation—the resin sinks in the water."[3] In 1847,[4] Mr. J. R. Lewis made a good analysis of the drug, describing the resins and stating that six or eight grains had been taken as an experiment, operating as a drastic cathartic accompanied by vomiting. Thus it is evident that King (1844) and Lewis (1847) independently wrote upon the subject, both referred to the substance under consideration, which King had used for some years preceding his published paper, and both of them called the substance a resin. If Mr. Lewis was acquainted with the recorded statements of Prof. King, he neglected to refer to them, and it is probable that he was unaware of their existence. From that early day Prof. King energetically and continuously held this resin before his classes, and in his writings advocated the use of resin of podophyllum as the Eclectic substitute for calomel. It became thereby

[1] Am. Journ. Pharm., January, 1832, p. 273.

[2] *Western Medical Reformer*, April, 1846, p. 176.

[3] Preceding this, Prof. King referred to the resin in the *Philosophical Medical Journal*, of New York, 1844. Vol. 1, p. 160.

[4] Am. Journ. Pharm., August, 1847, p. 169.

firmly identified as an Eclectic remedy long before the Regular[1] section recognized its value. In connection with this phase of the subject we find that the *United States Dispensatory*, preceding its tenth (1854) edition referred only to the analysis of Mr. Lewis. In that edition mention is also made of the notice Mr. Manlius Smith gave the resin in the AMERICAN JOURNAL OF PHARMACY, 1852. In the eleventh edition (1858) the first reference is made to its then common name in commerce, as follows: "It is called *podophyllin*," but it was not commended as a therapeutical agent. In the twelfth edition (1865), the resin having become officinal in 1860, a creditable notice is given the substance. In contradistinction, the first edition of the *Eclectic Dispensatory*, King and Newton, 1852, devotes seven pages to this drug.

In an early publication[2] Prof. King stated that "My introduction to its therapeutical action having been of a serious character," at the solicitation of the writer contributed the following interesting communication connected with the discovery and introduction of this important drug:

Cincinnati, June 14, 1887.

PROF. JOHN U. LLOYD,

Dear Sir:

In answer to your request, I will state that my discovery of podophyllin was by no means a pleasing incident, and I will relate it to you as briefly as possible. In the fall of 1835, desiring to make a hydroalcoholic extract of mandrake root (with the aid of potassa during evaporation), the tincture of the root, and its subsequently made infusion, were mixed together. In order to save as much of the alcohol as possible, this mixture was placed in a distilling apparatus, and when about one-third of the alcohol had been collected, by the distillation, the operation was discontinued on account of approaching night. Upon opening the kettle the next morning, and stirring up the now cold mixture, previous to a reapplication of heat and continuation of the distillation, a peculiar substance was found deposited in it, which I at first thought from its appearance was some foreign material that had found its way into the liquid

[1] I use this term as applied to the dominant section of American Physicians, because their members seem as a rule to prefer it to Allopathic. The term "Irregular" I do not consider opprobrious as applied to those of the minority.

[2] *The College Journal of Medical Science*, Cincinnati, 1857, p. 557.

and become burnt, or injured by the heat during the distillation of the previous day. While pondering over the matter, and still undetermined as to the nature of this deposit, I decided to investigate its action as a purgative, and accordingly administered about twelve grains to a patient, not supposing it to have much of any medicinal action. But I was soon brought to know the reverse. In an hour or two after having taken it, the lady was attacked with hypercatharsis and excessive vomitings, which continued for two or three hours before I was notified. I was truly alarmed at her condition, fully recognized the nature and remedial power of the resin, as well as my responsibility in having permitted her to take a substance concerning the action of which I knew nothing. It was a serious lesson to me which I have never forgotten.

I found her in severe pain and distress, cramps in the stomach and extremities, with coldness, and slight lividity of the surface, pulse small and weak, almost incessant vomiting and purging, her condition greatly resembling that of one in the latter stage of a fatal attack of Asiatic cholera—she was apparently sinking rapidly. It is unnecessary to occupy time and space with the treatment pursued, suffice it to state that by a careful and persistent course of medication and nursing for three or four days, she recovered; but, unfortunately, was left with a chronic malady of the digestive organs, which, as far as I know, was never removed.

These serious effects, together with many unpleasant surroundings at the time naturally associated with the event, produced a very unfavorable impression concerning the resin, and several years passed before I mustered courage to try it again in smaller doses, and which attempt was greatly owing to a conversation with Prof. W. Tully, M.D., of Yale College, New Haven, Conn., who, upon having related to him my fearful initiation in the use and action of resin of podophyllum, advised me to test it in much smaller doses; during this conversation he informed me that Cimicifuga likewise contained a resin, and which I subsequently succeeded in obtaining. After having successfully tested podophyllum resin in several varieties of disease, I called attention to it in *The Philosophical Medical Journal*, of New York, vol. i, p. 160, 1844, and subsequently, in connection with other preparations, in *The Western Medical Reformer*, of Cincinnati, vol. v, pp. 175, 176, 1846. About a year after this latter publication, being in the drug store of the

late Mr. W. S. Merrell, at that time located on the N. W. corner of Court and Plum Streets, Cincinnati, O., he called my attention to two samples, one of podophyllum resin, the other of cimicifuga resin, about an ounce or so of each, which he said were made according to my directions in *The Western Medical Journal*, and inquired if they were anything like those I had produced. I answered him that they were, and questioned him whether the Eclectic physicians of Cincinnati had tried them. He stated in reply that he had not been able to prevail upon them to prescribe them. According to promise given to Mr. Merrell, I shortly afterward gave Prof. T. V. Morrow, M.D., a few hints as to the value of these resins, and it was not long before communications appeared from the pens of Prof. Morrow, Hill, and others, in which the remedial virtues of these agents were highly lauded, from which time resin of podophyllum, more especially, has been extensively employed by all classes of physicians.

Yours truly,

JOHN KING, M.D.

From a careful review of the literature, and from an intimate acquaintance with those connected with the introduction and discovery of the substance, I feel that without a question the foregoing comprises the facts in justice to all concerned.

[*To be continued.*]

PODOPHYLLIN EMODI.

BY F. A. THOMPSON, Ph.G.

In the Pharm. Journal and Transactions, Jan. 26, 1889, page 585, Messrs. Dymock and Hooper state "that the genus Podophyllum contains only two species, one Himalayan and the other American.[1] The former, *P. Emodi*, Wallich, inhabits shady valleys on the inner range of the Himalaya and is very abundant in Kunawur and Cashmere. The root agrees in most particulars with that of *P. peltatum*, but differs in the intervals of the knots whence aërial stems are given off, the knots being more frequent in this species. They state that the sample examined by them yielded 12 per cent. of amorphous resins, of a pale orange-brown, soluble in alcohol, ether, chloroform

[1] According to the same authors, in Pharmacographia Indica, I, p. 69, two additional species of Podophyllum are found in China.—EDITOR AM. JOUR. PHAR.

and almost entirely so in ammonia, and upon ignition left no residue; and that when given in doses of ½ grain it produced slight griping sensation not uncommon to podophyllin when administered by itself."

From the large yield of resin, similar to podophvllin in physiological action, this drug seems worthy of further investigation, and thus I am prompted to make known my limited experience with the resin, made from P. Emodi.

A sample was placed in my hands with the request to compare it with podophyllin, as to amount of active principle, podophyllotoxin, it contained. My sample was small, weighing less than 3 grammes, and a portion of a small lot made in Bombay from a few of the roots, which yielded in this case 9 per cent. resin. Upon incineration it left no ash and dried at 100° C. till constant weight, lost 4·2 per cent. moisture.

Two grammes treated with benzin extracted 0·080 cm. of oily and waxy matter. The drugs were exhausted with chloroform, the chloroform percolate evaporated on a steam bath to a small volume, and then gradually poured into 30 cc. of ether. The ethereal fluid was decanted from the agglutinated precipitate, which was washed with several portions of ether, and the total ethereal solutions evaporated, and the residue, amounting to 0·261 gramme, weighed as *podophyllotoxic acid.* The precipitate of *podophyllotoxin*, was dried on a steam bath to a constant weight of 1·131 grammes.

RECAPITULATION OF ANALYSIS.

	Per Cent.
Ash,	none.
Moisture,	4·2
Oily and waxy matter, soluble in benzin,	4·0
Podophyllotoxic acid,	13·1
Podophyllotoxin, active principle,	56·55
Inert matter, insol. in chloroform and sol. in alcohol,	22.15
	100·0

The percentage of active principle, podophyllotoxin, in this sample is fully 25 per cent. higher than the average amount found in resin of podophyllum, which varies from 40 to 45 per cent. American podophyllum yields on a large manufacturing scale, 5 per cent. of podophyllin, and accepting 10 per cent. as a practical average from the Indian, we would have a drug worth 2½ times in value.

The literature regarding P. Emodi is limited, and therefore it is impossible to state whether this drug is sufficiently abundant to gather, even at a much higher value than mandrake root; but it is hoped that we may have more than one source of this resin.

DETROIT, MICH., April 22, 1890.

GLEANINGS FROM THE GERMAN JOURNALS.

BY FRANK X. MOERK, Ph.G.

Orexin is the name given by Prof. F. Penzoldt to phenyldihydrochinazolin hydrochlorate, which was found to be a true stomachic not only creating an appetite, but also assisting the digestion of foods. This action of orexin was not deduced from its formula, but was discovered in studying its effects upon the human system; the remedy apparently acts by producing local irritation and is best prescribed in gelatin-coated pills, as follows: Orexin hydrochlor., 2·0; extract. gentianæ, and pulv. rad. althææ āā q. s. M. f. pilulæ No. 20. D. S. 3–5 pills to be taken once or twice daily with a cup of beef tea.—*Pharm. Ztg.*, 1890, 115.

The detection of nitrobenzol or oil of mirbane in oil of bitter almonds succeeds easily by warming the suspected oil with black oxide of manganese and sulphuric acid. Nitrobenzol does not lose its odor by this treatment, on the contrary, the odor becomes more pronounced, after standing for awhile an odor of oil of cinnamon is developed; oil of bitter almonds at first develops a disagreeable odor which, after some time, entirely disappears.

To detect nitrobenzol in soaps, solutions, etc., soaps are first dissolved in water; the solutions are treated with an excess of slaked lime, extracted with ether, the ethereal solution evaporated to dryness on a water bath and the residue shaken up with a little water. In a small porcelain capsule are placed two drops liquefied carbolic acid (made by adding 10 parts water to 100 parts of the crystallized acid), three drops distilled water and a piece of potassium hydrate of the size of a pea. This mixture is heated to the boiling point, care being taken to prevent charring of the mass, and a few drops of the ethereal residue mixture added; on continued boiling a carmine-red ring is formed around the edge of the liquid, the depth of color depending upon the quantity of nitrobenzol present; the

addition of calcium hypochlorite solution changes the red into a beautiful green color.—J. Morpurgo, *Pharm. Post*, 1890, 258.

Chloroform in ethyl bromide.—In the preparation of the latter chemical from potassium bromide, alcohol and sulphuric acid, the product always contains ether which cannot be removed in the rectification, and which will give a preparation of low specific gravity. To overcome the low gravity it is not unlikely that chloroform may be added until the correct gravity is obtained; such an addition could only be detected by chemical means, and here the simplest test depends upon the isonitril reaction: A few cc. of the sample with an equal volume of strong sodium or potassium hydrate solution and one drop of aniline are agitated in a test tube; the application of a little heat should develop no odor differing from the cold mixture. Bromide of ethyl with 1 per cent. of chloroform gave immediately the offensive odor of carbylamine. This same test allows of the ready distinguishing between chloroform and ethyl bromide.—Dr. L. Scholvien, *Pharm. Ztg.*, 1890, 138.

Boroglycerin-Cream.—1·0 boric acid is dissolved with the aid of heat in 24·0 glycerin and allowed to cool. 5·0 anhydrous lanolin and 70·0 paraffin ointment are melted together, colored by addition of 0·01 alkannin, the boroglycerin added, stirred to creamy consistence and perfumed with one drop each of oils of rose and bergamot. —E. Dieterich, *Pharm. Centralhalle*, 1890, 158.

Diachylon Wound Powder.—5·0 lead plaster and 2·0 yellow wax with 20·0 ether are agitated in a flask until solution or perfect disintegration of the lead plaster results. 45·0 wheat starch, 45·0 talcum and 3·0 boric acid, all in very fine powder, are mixed in a mortar, then the ethereal solution added, perfumed with one drop each of the oils of wintergreen and bergamot and exposed on parchment paper at ordinary temperature until the volatilization of the ether. This powder is valuable as a dusting powder in chafing, sore feet, etc.—E. Dieterich, *Pharm. Centralhalie*, 1890, 158.

Lanolin Dusting Powder.—5·0 anhydrous lanolin are dissolved in 20·0 ether and rubbed up with 45·0 wheat starch; by exposure the ether is allowed to evaporate. 2·0 powdered boric acid and 50·0 powdered talc are mixed with the lanolin starch powder and flavored by the addition of one drop each of oil of wintergreen and oleo-balsamic mixture.—E. Dieterich, *Pharm. Centralhalle*, 1890, 159.

Syrup of Coffee.—200·0 finely ground coffee are moistened with

250·0 distilled water and 50·0 spirit of cognac and then 800·0 boiling simple syrup added; the vessel is covered, set aside for 15 minutes in a moderately warm place, and after standing at ordinary temperature for 24 hours, the liquid is filtered. This formula gives a superior product, if the directions are followed closely.—E. Dieterich, *Pharm. Centralhalle*, 1890, 160.

Adhesive masses for plasters, intended to increase the adhering property of plasters, may be made with rubber or gutta-percha as the base. *Massa emplastica cummea.*—10 parts rubber, in fine shreds, are added to a melted mixture of 25 parts anhydrous lanolin and 25 parts resin, stirring with an iron spatula and heating moderately at first, afterwards to 180–200° C., until the rubber is completely dissolved; 25 parts resin and 10 parts dammar resin are now added, and heat is applied until a homogeneous mixture is obtained, which is poured into porcelain vessels and set aside for use. *Massa emplastica perchata* differs from the other mass only in having gutta-percha instead of rubber. The gutta-percha is softened by kneading under hot water, drawn out into thin ribbons, and cut into shreds before adding it to the melted lanolin and resin. The addition of 25 per cent. of these masses to the regular plaster mass will cause the plaster to adhere to the body for weeks; should the plaster contain mineral oils, 30 per cent. of the adhesive masses should be added. The anhydrous lanolin is of especial value in absorbing the moisture eliminated by the body, so maintaining the adhesive property of the plaster.—H. Hager, *Pharm. Ztg.*, 1890, 108.

MINUTES OF THE COLLEGE MEETING.

PHILADELPHIA, March 31, 1890.

A stated meeting of members of the College was held this day at 3½ o'clock, P.M., Charles Bullock presiding. There being no quorum at the previous meeting in December and no business transacted, the minute of the meeting in September was now read and on motion adopted. The minutes of the meetings of the Board of Trustees for October, November and December, 1889, and of January, February and March, 1890, were also read and on motion approved. This being the annual meeting, the reports of officers and committees were called.

The Editor, Prof. J. M. Maisch, submitted the following: "During the past year the JOURNAL published sixty-four original papers, of which thirty-seven were contributed by thirteen members of the College, while twelve papers were furnished by ten authors who are not members. The remaining fifteen papers consisted of abstracts from forty-five theses. Eighteen of the papers had

been read at meetings of the College, and for twenty, including a number of theses, the investigations had been performed in the chemical laboratory of the College. Besides these papers, a large number of original translations, including gleanings and abstracts from European papers, were published—also editorials, reviews and other matter prepared by the Editor, and essays selected from other journals. It appears to the Editor that during the past year the pharmaceutical meetings have not been as well attended by the members of the College as their interests and usefulness would seem to suggest."

The report of the Business Editor was presented; likewise the report of the Chairman of the Committee on Publication, which contained the following statement, among others:

"The JOURNAL has been issued with regularity and promptness, and its character as an exponent of scientific and practical pharmacy and chemistry maintained. As foreshadowed in previous reports, the Committee still find it difficult for reasons stated to extend its circulation and advertising patronage as much as they could wish, but believe that, under the circumstances that prevail, they are doing as well as possible."

On motion of Mr. Webb $500 were appropriated by the College on account of the bill presented by the Publishing Committee.

The Librarian in his annual report states that "several very valuable works have been added to the Library—among these the Repertorium of Buchner (110 volumes), a gift from Prof. Maisch—also some valuable documents from the Government Printing Bureau, through F. W. Leach, Esq."

Mr. Joseph W. England, the Curator of the College, reports—"The Museum is in good condition—valuable accessions having been received during the year. Its value, as a medium of reference to the student, is becoming more apparent. To facilitate its usefulness it is requested that a wooden case, containing blank cards (similar to that used in the Library), be provided—this to be used for indexing the museum contents, in addition to the present index. Students are given ample opportunity to inspect the collection during the lecture season."

Prof. Remington moved that the Curator's request for index cards be referred to the Committee on Property, with power to act. The motion was carried.

A communication was received from Dr. L. Wolff, member of the College, tendering his resignation and requesting to be permitted to retain his certificate. His resignation was accepted, and his request granted.

Reference was made to the death of Walter T. Baker, formerly a member of this College, and the subject referred to the Committee on Deceased Members.

The election of officers and trustees being next in business order, resulted as follows:

President—Charles Bullock.

Vice-Presidents—Robert Shoemaker, William J. Jenks.

Treasurer—William B. Webb.

Corresponding Secretary—Dr. A. W. Miller.

Recording Secretary—William B. Thompson.

Librarian—Thomas S. Wiegand.

Curator—Joseph W. England.

Committee on Publication—Henry N. Rittenhouse, Chairman; James T. Shinn, Chas. Bullock, Thos. S. Wiegand, J. M. Maisch, Editor.

Editor—Prof. John M. Maisch.

Trustees for 3 years—T. Morris Perot, J. P. Remington and James T. Shinn.

A motion to elect delegates to represent this College at the meeting of the Penn. Pharm. Assoc., to be held at York, in June next, resulted as follows: Dr. Clement B. Lowe, Wallace Procter, Alonzo Robbins, John M. Maisch, Joseph P. Remington.

On motion adjourned. W. B. THOMPSON, *Secretary.*

MINUTES OF THE PHARMACEUTICAL MEETING.

PHILADELPHIA, April 22, 1890.

On motion of Mr. E. M. Boring, Wm. B. Webb, Ph.M., was called to preside. The minutes of the last meeting were read, and no corrections being required, they stand approved.

Two quarto volumes of the second and third sections of the report of the Fisheries Industries of the United States, for the year 1880, were presented by the department for the library. There was also received part II of the Pharmacographia Indica, by W. Dymock, C. J. H. Warden and David Hooper, and a pamphlet in the Spanish language on Diálisis química, by Alfonso L. Herrera.

A letter was read announcing the presentation of ten cases of Materia Medica Specimens from Messrs. Parke, Davis & Co., which the actuary was directed to acknowledge with thanks when they shall have been received, and to report also to the Board of Trustees.

A paper upon *Xanthoxylum fraxineum*, by Prof. J. U. Lloyd, of Cincinnati, was read by Prof. Trimble; also a paper on crystalline principles of *prickly ash bark*, by E. G. Eberhardt. The papers were accompanied by crystalline principles, prepared by Mr. Lloyd, and other samples with several derivatives, prepared by Mr. Eberhardt; the latter is still engaged with the further investigation of these principles. Prof. Maisch said he was anxious to obtain flowers, leaves and bark of the southern varieties of prickly ash which seem to be peculiar to Florida.

A paper upon Standardization of drugs was read by Mr. G. M. Beringer, Ph.G., which was listened to with great attention. Prof. Maisch read some paragraphs from the Ephemeris of Dr. Squibb, and closed with a paper treating upon the same subject.

A member remarked that whatever the weight of evidence on some points might be, he felt that Standardization was a move in a proper direction, if greater uniformity in the strength of medicines could be secured thereby. The further discussion on this subject related to the natural variations in the composition of plant products, grown under identical and under different conditions; to the identification and estimation of constituents of similar chemical character, but differing in physiological action; to the quality of drugs agreeing with pharmacopœial descriptions, and to allied subjects. It was then suggested that, owing to the late hour, further discussion be discontinued for the present, and that after reading all the papers on the subject in the forthcoming journal, and also others, members might be prepared to renew discussion on this important subject at the next pharmaceutical meeting, to be held on the third Tuesday in May.

There being no further business, on motion, adjourned.

T. S. WIEGAND,
Registrar.

PHARMACEUTICAL COLLEGES AND ASSOCIATIONS.

Philadelphia College of Pharmacy.—The past session was the first one covering the extended term, that of the junior class having been lengthened from 4½ to 5¼ months, and the senior class from 5 to 6 months. The *junior examinations* were held November 9th, December 14th and March 8th, the questions in the different branches being as follows:

BOTANY AND MATERIA MEDICA.

(1) Describe the conditions for the formation of a cell. What are the contents of a newly-formed cell? What is the original shape of a cell, and from what influences is this shape subsequently altered? Name and briefly describe the appearance of some of the cell contents having a definite shape.

(2) Give a full explanation of the manner in which you would write out an intelligent description of an expanded part of a plant, like a leaf. Name and explain some of the descriptive botanical terms for expanded parts of plants.

(3) Describe and illustrate by sketches the following: Fibrovascular bundle of monocotyledonous stems; Fibrovascular bundle of dicotyledonous stems; Palisade layer; Stoma.

(4) Explain the following: Acaulescent herb; Shrub; Rhizome; Bulb. Give also one or two examples for each of the above.

(5) *Cloves:* Give the botanical name of the plant yielding cloves. What part of the plant is used? Describe the officinal article, giving the characteristics of calyx, corolla, androecium and gynæcium. Name the most important proximate principles of the drug and state the percentage of each. Name some other drugs obtained from the same natural order.

(6) Explain the structure (number of carpel-leaves, placentation, dehiscence) of the following *fruits*, and give one or more examples of each kind: Akene, Follicle, Legume, Silique. By what characteristics may a *seed* be distinguished from a fruit?

THEORY AND PRACTICE OF PHARMACY.

(1) Describe specific gravity bottles. By what name are they now known? What are they used for? How is a specific gravity bottle used for liquids? How is a specific gravity bottle used for solids? Describe and illustrate by a drawing a hydrometer.

(2) Explain the difference between an illuminating gas flame and one used solely for heating purposes. How may the former be converted into the latter?

(3) Define the terms cubic centimetre, gramme, litre, kilogramme, milligramme and centimetre. Give their equivalents in apothecaries' weight and measure. What is the specific gravity of a liquid, of which one pound avoirdupois will measure one pint?

(4) Define Desiccation as used in Pharmacy, state its objects and describe the apparatus used in the process. Define Deliquescence and Efflorescence; name two substances which are liable to deliquesce or effloresce, and state how deliquescence or efflorescence may be prevented.

(5) Describe the principle of action of the process of percolation. What is repercolation, and to what class of preparations is it especially adapted?

(6) Describe the officinal process for making oxide of zinc. What difference is there in the appearance of the officinal and commercial oxides? How is ointment of oxide of zinc made?

CHEMISTRY.

(1) Upon what principle do we base the composition of "freezing mixtures?" Give the composition of one or more such mixtures, showing how they illustrate the principle before stated.

(2) State the distinction between a native magnet, an artificial maguet, and an electro-magnet. Which of these classes is the most powerful in its action? Mention any useful application any of these classes have in practice.

(3) What is *Aqua Chlori?* How is it made—from what materials and with what form of apparatus? What are the uses of *Aqua Chlori?*

(4) Describe the element *Iodine* and state whence it is obtained. Give the formulas of three compounds of iodine and metals. State some of the pharmaceutical preparations in which iodine is the essential constituent.

(5) Give the chemical formulas of the several phosphoric acids and state their basicity. Write the formulas of the sodium salts of these several acids. Give the chemical formula of an officinal hypophosphite.

(6) Complete the following reactions, and name the several substances used in the reaction and the products obtained.

$$CaOCl_2 + 2HCl =$$
$$Na_2S_2O_3 + H_2SO_4 =$$
$$2NaHCO_3 + \text{heat} =$$

QUESTIONS BY EXAMINING COMMITTEE.

(1) Name ten of the classes into which the preparations of the United States Pharmacopœia are divided. Write the correct Latin officinal name of one preparation from each, immediately after the title of the class to which it belongs.

(2) How does the *venation* of monocotyledonous and dicotyledonous plants differ? How do *pinnate* and *palmate* leaves differ? Illustrate by diagram, the following forms of leaves: *Ovate, Lanceolate, Sagittate, Peltate.*

(3) State the weight in grammes of the quinine contained in one litre of fluid extract of cinchona, U. S. P., if the bark from which it was made yielded 2·75 per cent. of the alkaloid and was thoroughly exhausted.

(4) Name the ingredients and proportions of each, which enter into the composition of *Seidlitz Powder.* What is its officinal name? What reaction takes place when they are mixed? How should it be kept in stock? What is the result of improper keeping?

(5) How is *nitro-hydrochloric acid* made by the officinal process? What should be produced by the reaction? What is the synonym of this acid? How is *diluted nitro-hydrochloric acid* made? State its medicinal properties and dose.

SPECIMENS.

Chelidonium.	Aqua Amygdalæ amaræ.	Acidum sulphurosum.
Aurantii flores.	Mistura Ferri et Ammonii acet.	Potassii nitras.
Chondrus.	Syrupus Tolutanus.	Sodii boras.
	Ferri sulphas præcipitatus.	

In Operative Pharmacy each student was required:

(1) To prepare two fluid ounces of syrup of iodide of iron.

(2) To dispense twelve powders, each containing Cinchoninæ sulph., gr. v, and Glycyrrhizæ pulv. gr. iij.

(3) To percolate 4 oz. of ground glycyrrhiza with a mixture of one fluid ounce of water of ammonia and one pint of water.

The examination of the senior students commenced March 29 and terminated April 3. The questions in the different branches were as follows :

MATERIA MEDICA AND BOTANY.

A—Gentian Root—Give the botanical name of the plant and its habitat. Describe the drug, including its structural characteristics. Name and briefly characterize the important principles of the drug. What effect will be produced upon the tincture or cooled decoction of gentian, *a* by ferric chloride and *b* by solution of iodine? Explain the reactions produced by the reagents just named. What other drugs are obtained from the order of Gentianaceæ? Name the characteristic principles present in these drugs.

B—Jalapa—Give the botanical name and the habitat of the plant. Describe the drug and explain its structure. Name its constituents, and give the percentage of the most active medicinal principle. What effect have simple solvents upon this principle? Explain its behavior to alkalies. What is the medicinal dose of jalap and of resin of jalap? In which of its chemical properties does resin of scammony resemble resin of jalap, and how may the two be distinguished?

C—Bittersweet—Name the plant, its habitat and the part officinal. At what season should the drug be collected? Give a description of the drug and of its structure. Name the important proximate principles of bittersweet, and state the medical properties and dose of the drug. Name two officinal alkaloids or alkaloidal salts procured from the same natural order to which the bittersweet plant belongs. State the reaction by which these alkaloids may be best distinguished.

D—Prickly Ash—Name the plants from which this bark is procured; also their habitat, and the natural order to which the plants belong. Describe the bark, including it structure. By what characteristics may the two principal commercial varieties of prickly ash bark be distinguished? What other bark has been confounded with prickly ash, and how does it differ from the officinal bark? Name the important proximate principles of prickly ash, and state its medical properties and dose. Name other drugs obtained from the same natural order.

E—Senna Leaves—Give some of the botanical characteristics of the section *Senna*, genus *Cassia*. Point out from which of these characters the plant yielding the so-called American senna differs. Name the commercial varieties of officinal senna. Give for each variety the botanical name of the plant yielding it. Describe the characteristics of the commercial varieties of senna, and give for each variety the admixtures or adulterations sometimes met with, and the characters by which these may be recognized. Name, and briefly characterize the more important proximate principles of Senna. What effect upon Senna leaves has each of the following solvents: Alcohol, diluted alcohol and boiling water?

F—Labiatæ—Give the botanical names of the plants of the order of Labiatæ yielding officinal herbs, leaves or flowers. State in each case which part is directed by the Pharmacopœia? Its medical properties, and dose, and whether the medical properties reside mainly in volatile oil or in bitter principle. Give

some of the properties (specific gravity, solubility, taste,) of the officinal oils of Labiatæ. Name two stearoptens procured from this natural order; also the plants yielding the same, and give the characteristic properties of these stearoptens.

G—Cardamom—Give the name of the plant yielding Cardamom, its natural order and its habitat. Which part of the plant is officinal? When is it collected? Describe the drug, including its structure. Name the proximate principles present, giving the percentage of the more important constituents. Give the medical properties and dose. Which part of the drug is rejected in preparing "aromatic powder," and for what reason? What percentage of the weight of the drug is the rejected part?

H—Stavesacre—What is Stavesacre? Name the plant and give its habitat. Describe the drug, including its structure. What are its medical properties and uses? What alkaloids does the drug contain? Name three other drugs derived from the same natural order, and give for each the medical properties, dose and the medicinally active principle.

I—Opium—From what tissue of the poppy capsule is Opium obtained? and how is it prepared? By what physical characters may the quality of good opium be determined? Give the outlines of the pharmacopœial test for ascertaining, chemically, the quality of opium. Which principles, commonly found in plants, are absent from opium? Describe a characteristic reaction of the acid peculiar to opium. Give the average adult dose of opium, of morphine and of codeine. What antidotes are indicated in cases of poisoning by opium?

K—What is the average composition of *cow's milk?* Which plants contain the alkaloid *sanguinarine?* Name the poisonous principle of certain *Ericaceæ;* also name some of the plants containing this principle, and other ericaceous leaves which are free from it. Give the characteristic chemical reactions of *gallotannic acid.* Give the characteristic color reactions of *strychnine* and *brucine.*

THEORY AND PRACTICE OF PHARMACY.

A—How many fluid ounces of *water* must be added to a pint of *solution of chloride of iron* (sp. gr. 1·405 containing *37·8 per cent.* of anhydrous salt) to make the solution contain *10 per cent.* of anhydrous salt? If officinal *solution of tersulphate of iron* contains *28·7 per cent.* of normal ferric sulphate, how many *grains* will be found in *one pint?*

B—Give the unabbreviated officinal names, ingredients, brief outline of process, and describe the appearance of *Donovan's Solution, Fluid Extract of Squill, Syrup of Hypophosphites, Infusion of Digitalis, Extract of Taraxacum, Glyconin, Tincture of Musk, Chalk Mixture.*

C—Give the English name or synonym, ingredients, brief outline of process, and describe the appearance of *Mistura Ferri Composita, Pulvis Rhei Compositus, Syrupus, Unguentum Hydrargyri Nitratis, Tinctura Lavandulæ Composita, Vinum Ergotæ, Emplastrum Capsici, Spiritus Ætheris Compositus.*

D—What is *Malt?* Describe the process, with the precautions necessary for obtaining it; explain the various changes which take place in the substance from which it is made. Name an officinal preparation of malt. What valuable ferment does it contain? Give a brief process for the officinal preparation.

E—Give the principle tests of identity for *Morphine, Aconitine, Quinine, Coniine, Colchicine.*

F—To what class of proximate principles does *Camphor* belong? State how it is obtained, and how it is refined. What action has camphor upon resinous substances? Name five *good* solvents for camphor and two *poor* solvents for it. How would you compound the following prescriptions?

℞
Camphoræ, gr. xx
Syr. Zingib. f℥i
Aquæ Camph., f ℥iij
Misce sec. art.
Sig. A teaspoonful when required.

℞
Camphoræ, gr. xx
Chloral., gr. xv
M. ft. pil. No. xxx
Sig. One at night.

G—Describe the method of making tablet-triturates. How do these differ from tablet-saturates? What advantages or disadvantages do these tablets possess over similar methods of medication? How are compressed pills made? What are their advantages and disadvantages?

H—What addition or manipulation could be suggested for each of the following prescriptions, which would not interfere with their medicinal effect and yet improve their appearance or facilitate their dispensing?

℞
Sodii Salicyl., gr. xxx
Spt. Æther. Nit., ♏ xxx
Aquæ, f ℥ij

℞
Argenti Oxid., gr. xii
Creasoti, gtt. x
M. ft. pil. No. xij

I—Examine the following prescriptions and if you would dispense them, state the proper method, writing the names in English of each ingredient, explaining the difficulties if any exist, and give the quantity of the finished preparation in each case.

℞
Syr. Acaciæ ℥iij
Tr. Card. comp. gr. xvi
Quin. Sulph. ℥i
M. S. a tablespoonful three times a day.

℞
Potass. chlorat. ʒi
Aquæ bull. ℥i
Solut. Morph. ℥i
Syr. Tolu ℥ij
M.

℞
Extr. Secal. corn. fl. f℥i
Vini ejusd. f℥i
Sacch. alb. ʒss
M. S. a teaspoonful every 2 or 4 hours as needed.

K—State whether it is proper to filter the following prescriptions, and whether their appearance would be improved by filtration; give the reasons for your judgment and indicate the correct procedure:

℞
Potassii Iodidi, ʒi
Tr. Guaiaci Amm., f℥ss
Vin. Colch. Rad. f℥i
Aq. Menth. Pip. q. s. ad f℥iij
M. Sig. Half a teaspoonful after meals.

℞
Potassii Bromidi, ʒiij
Syr. Chloral, f ℥ij
Aq. Fœniculi, q. s. ad f℥ij
Sig. A teaspoonful at bed-time.

℞

Hydrarg. Chlor. Mit., ʒi
Liq. Calcis, fʒiv
Sig. Apply morning and evening.

CHEMISTRY.

A—Write the chemical reactions for the preparation of pure Carbonate of Soda by the Leblanc process, naming all the products. Do the same for the "Ammonia-Soda" process. Do the same for the Cryolite process.

B—What is the composition of Sal-Ammoniac? Of *Ammonii Carbonas?* Of *Ammonii Nitras?* Of *Ammonii Sulphas?* Of *Ammonii Phosphas?* Write the chemical reaction for the decomposition of Sal-Ammoniac by quicklime—for the decomposition of Ammonium Nitrate by heat.

C—Describe the metal Aluminum. Give an outline of the more important processes for its manufacture. Mention any important uses of the metal or its alloys.

D—Write the chemical formulas for the following officinal salts of iron: Chloride, Hypophosphite, Phosphate, Oxalate, Sulphate, Ferrocyanide and Nitrate. State by what tests Ferrous salts can be distinguished from Ferric salts. State how a Ferrous compound can be converted into the corresponding Ferric compound.

E—What is the chemical composition of "White-Lead?" How is it made? What uses has it in pharmacy and in the arts? With what is it often adulterated, and how can the adulteration be detected?

F—What is the distinction between drying oils and non-drying oils—(*a*) in chemical composition; (*b*) in physical properties; and (*c*) in practical applications? Give illustrations of each class.

G—How do you distinguish the Glucose class of sugars from the Sucrose class? Describe the successive changes that starch undergoes under the influence of dilute acids or ferments. Give the names of the products obtained from starch, and state how they may be identified.

H—What is an essential oil, and how do they differ physically and chemically from the fatty oils? Into what several groups may these essential oils be divided? What alteration products often accompany the essential oils? What is the chemical character of these accompanying products? What are the pharmaceutical and technical uses of the essential oils and their products of oxidation?

I—Write the graphic formulas of *Alcohol*, of *Aether*, of *Acidum Carbolicum*, of *Acidum Benzoicum*, of *Acidum Gallicum*. Give the correct chemical names of "Antifebrin," of "Vanillin," of "Antipyrin."

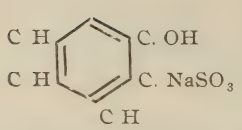
K—Give both the officinal and the exact chemical names for the following compounds:

(1) $CH_3 \cdot CO \cdot OH$

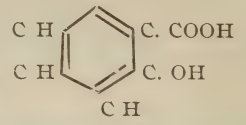
(2) $CH_3 \cdot CO \cdot OC_2H_5$

(3) $CH_2(OH) \cdot CH(OH) \cdot CH_2(OH)$

(4)



(5)



QUESTIONS BY EXAMINING COMMITTEE.

A—Give the officinal name and definition of the following drugs: *Lactucarium*, *Tragacanth*, *Asafœtida*, *Guarana*, *Benzoin* and *Storax*. State the botanical name, natural order and habitat of the plants which furnish them, and name an officinal preparation into which each one enters.

B—*Acidum Aceticum*. From what and how is it prepared? Briefly outline the process for the purification of the crude acid. Name the three officinal strengths of acetic acid, with the percentage of absolute acetic acid contained in each. How may the presence of (*a*) lead; (*b*) copper; (*c*) sulphuric acid, or (*d*) empyreumatic substances be detected in acetic acid?

C—What would one pint of a menstruum weigh, if it consisted of 50 per cent. of alcohol, 30 per cent. of glycerin and water (by weight). What would ten pounds of *Pulvis Jalapæ compositus*, U. S. P., cost, if Cream of Tartar was worth 27 cents per pound and powdered Jalap 35 cents, with 5 per cent. added for labor in mixing?

D—Give the officinal and common names of the medicinal substances obtained from *Baroma betulina*, *Sanguinaria canadensis*, *Garcinia Hanburii*, *Eugenia caryophyllata*, *Cimicifuga racemosa*, *Fraxinus Ornus*, *Acipenser Huso*, *Anthemis nobilis*, *Physeter macrocephalus* and *Cetraria islandica*. State what part in each constitutes the *Officinal Drug*, and name an *Officinal* Preparation into which each one enters?

E—How many parts each of *Potassium Bicarbonate* and *Citric Acid* are required to make one hundred parts of Potassium Citrate? How many parts each of *Sodium Bicarbonate* and *Salicylic Acid* are required to make one hundred parts of Sodium Salicylate?

F—Give three tests for *Tannic acid;* two tests for *Gallic acid*. What is the action of pure *ferrous sulphate* on *tannic acid?* How do *Cane sugar* and *Grape sugar* differ toward chemical reagents? Give three tests for distinguishing *Tartaric* from *Citric acid*.

G—Name the ingredients which enter into the composition of *Compound Liquorice Powder*. Give the botanical name, natural order, habitat and officinal portion of the plants yielding the constituents thereof.

H—Give the botanical name, habitat, medicinal properties and active constituents of *Valerian*. Name four officinal preparations; state briefly how each is made, and how much Valerian would be required to make four pints of a preparation, if each fluid drachm is represented by 10¼ grains.

I.—How would you compound the following prescriptions:

℞

Ext. Opii, gr. x
Ext. Krameriæ, ℈i
Camphoræ, gr. xx
Ung. Iodi, ℥i
M. ft. Unguent.

℞

Ol. Copaibæ, ♏ ii
Magnesiæ, gr. ii
Acaciæ pulv., gr. i
M. ft. pil.
Mitte tales xxxvi

Would you dispense this? If so, how would you compound it?

℞

Ext. Ignat. Amar., ʒss
Acid. Sulph. Ar., gtt. xxiv
Elixir. Cinchonæ, fʒvi
M. Sig. A dessertspoonful in a little water after breakfast and after dinner.

K—Rewrite the following prescriptions giving the quantities and ingredients in English. State whether it would be proper to dispense them as written; if so, show what additions, if any, should be made. Give your reasons for your judgment.

℞

Morph. Sulph. o | 12
Atropiæ o | 06
Ft. ch. No. x.
One every 3 hour.

℞

Chinin. Sulph. gr. x
Morph. Sulph. gr. ⅙
Dent. tal. dos. No. iv

℞

Pil. Hydrarg. gr x
Morph. sulph.
Pulv. Camph. gr. iij
Ft. Pil. No. vi.
S. One every 2 hours.

SPECIMENS.

Materia Medica.	*Pharmacy.*	*Chemistry.*	*Committee.*
Bryonia.	Aqua Fœniculi. fl	Aqua Chlori.	Gelsemium.
Veratrum vir.	Ext. Erythrox.	Acid. Boricum.	Eucalyptus..
Salix.	Lin. Terebinth.	Acid. Benzoicum.	Sambucus.
Quassia.	Liquor Pepsini.	Acid. Gallicum.	Pimenta.
Scoparius.	Mist. Amygdalæ.	Sodii chloridum.	Coriandrum.
Castanea.	Pepsinum sacchar.	Magnesii sulph.	Pulv. Rhei co.
Conium.	Syr. Ferri iodidi.	Ammonii carbon	Aqua Anisi.
Stramon. Sem.	Syr. Tolutanus.	Plumbi acetas.	Syr. Rhei arom.
Ergota.	Tinct. Calumbæ.	Æther aceticus.	Liq. Ferri Chlor.
Catechu.	Vin. Ferri amar.	Saccharum.	Potassii Chloras.

OPERATIVE PHARMACY.

Glycerin Suppositories.

℞

Stearic Acid, ... 10 gr.
Carbonate of Sodium, ... 5 gr.
Glycerin, ... 2 fl. dr.
Make six suppositories.

Pills.

℞

Ferri Citrat., ... gr. xlv.
Cinchon. Sulph., ... gr. xv.
Ol. Carui, ... gtt. xv.
M. Ft. pil. No. xv.

Write in English upon the label all of the ingredients and quantities used in the pills.

Granulated Salt.

℞

Salicylic Acid, ... 105 gr.
Carbonate of Sodium pure, ... 100 gr.
Make Salicylate of Sodium.

Emplastrum Belladonnæ.

Make Belladonna plaster by the following formula:

℞

Ext. Belladonnæ, ... gr. lx
Resinæ, ... gr. cxx
Ceræ Flavæ, ... gr. lx
Emp. Plumbi, ... ℥ ii

Spread Plaster.

Spread a Belladonna breast plaster about five inches in diameter.

ANALYTICAL CHEMISTRY.

Officinal salts, inorganic bases, inorganic and organic acids, either in the state of powder or in solution, were given for qualitative examination.

Seventeen candidates, having attained the grade very satisfactory in the examination of crude drugs and in descriptive materia medica, were entitled to compete for the J. M. Maisch prize, offered by Mr. J. H. Redsecker. At the examination which was held April 10, mounted specimens of the following drugs or sections of drugs were submitted: Arnicæ radix, Aurantii cortex, Caryophyllus, Cinchona rubra, Lupulinum, Nux vomica, and Taraxacum; also pollen of species of Pinus (possible adulteration of lycopodium), section of stem of Polygonatum (for determining class and part of plant) and section of cremocarp of Chærophyllum procumbens (for determining order and section, and part of plant). Fifteen candidates were present, all of whom recognized pine pollen; 14 nux vomica; 13 the umbelliferous fruit; 12 taraxacum root; 10 each cinchona and orange peel; 9 lupulin; 7 clove; 5 arnica root, and 4 the monocotyledonous stem. Ten and eight specimens were the two highest numbers recognized; and eleven of the candidates named correctly six or seven of the microscopical specimens.

The names of the successful candidates for the degree of Graduate in Pharmacy (Ph.G.) are given in the following list, which includes also those of several holding over from the preceding year; likewise the titles of the theses presented by the candidates.

Franklin Irving Adams, New York, Liquor Plumbi subacetatis dilutus.
John Maskell Allen, New Jersey, Solvents of Opium.
William Cummings Amsden, Iowa, Absent-minded Pharmacists.
Ferdinand Geisler Angeny, Pennsylvania, Saccharin.
Franklin Muhlenberg Apple, Pennsylvania, Glycerita.
William Appmann, Texas, Syrups by cold percolation.
William Dwight Barnard, Michigan, An investigation of ground Cloves.

Gustavus Adolphus Barwig, Pennsylvania, Bone black.
William Christopher Baur, Jr., Pennsylvania, Barbasco.
Charles Henry Bennum, Delaware, Petroleum.
Abraham Lincoln Besore, Pennsylvania, Estimation of Lycopodium.
Harry Lee Bickel, Delaware, Potassii bitartras.
John Jessiah Bilheimer, Pennsylvania, Syrupus Cubebæ.
Guido Carl Boecking, Pennsylvania, Pharmaceutical economy.
Alexander Carhart Bonnell, New Jersey, Psoralea Melilotus.
John M. Bowman, Pennsylvania, Appurtenances to the modern pharmacy.
William Willits Bright, Pennsylvania, Syrupus Ferri iodidi.
Edward Herman Buehl, Ohio, Officinal preparations of Cubebs.
Zack W. Bugg, Kentucky, Production of Tobacco.
Frank Eugene Burgess, Ohio, Glycerin Suppositories.
Charles Hayes Butters, Pennsylvania, Syrup of Ipecacuanha.
Florence Moore Caldwell, D. Columbia, Elixir of Iron, Quinine and Strychnine.
Clarence Henry Campbell, Maryland, Tinctura Cinchonæ composita (improved).
Clarence Edgar Carritte, Minnesota, Inexhaustion in percolation.
Benj. Franklin Cartwright, Pennsylvania, Eupatorium.
John Francis Cassidy, Pennsylvania, Liquids by weight.
James Truss Challenger, Delaware, Cannabis indica.
Jerome Percy Churchill, California, Adulteration of Potassium nitrate.
Samuel Coleman, Pennsylvania, Strophanthus.
Lemuel Belah Coley, Alabama, Extract of Pinus canadensis.
Francis Wade Cook, Pennsylvania, Tinctura Gentianæ composita.
George Hogan Copeland, Pennsylvania, Erythroxylon Coca.
Frank Wilbert Cotton, New Jersey, Preliminary education of a pharmacist.
William Howard Crane, Pennsylvania, Our noble profession.
James Lawson Crothers, Maryland, Piper methysticum.
James Kimmey Cullen, Delaware, Hypodermic tablets.
Dwight Kellum Darling, Washington (state), Art in pharmacy.
Frederick Samuel Day, Pennsylvania, Camphora.
Charles James Deitz, Pennsylvania, Celastrus scandens.
Peter Nicholas Duff, Ireland, Extractum Humuli fluidum.
Frederick Dunning, Maryland, The Oleo-saccharures.
Richard Gaillard Dunwody, Georgia, Turpentine.
Ernest Godlove Eberhardt, Indiana, Prickly ash bark.
William Fred. Eberhardt, Wisconsin, Hoang Nan.
Edwin Kemmerer Eisenhart, Pennsylvania, Iodum.
Henry Shaffer Engelman, Pennsylvania, Chloroform as an antifungoid.
Harvey Bowman Eyer, Pennsylvania, Manufacture of illuminating gas and by-products.
Joseph Benjamin Faries, Delaware, Rhamnus Purshiana.
George David Feidt, Maryland, Commercial Rhubarb.
Benjamin Kennard Fletcher, Pennsylvania, Examination of some acids.
Edward Elmer Frontz, Pennsylvania, Quillaia.
Harry Jacob Gearhart, Pennsylvania, Cydonium.
Wm. Joseph Napoleon Gervais, New York, Unofficinal Syrups.
Elmer Ellsworth Gibble, Pennsylvania, Antipyrine.

Charles A. Gill, Pennsylvania, Morphology of flowers.
Philip Goll, Germany, The U. S. Pharmacopœia of 1890.
Samuel Horace Gotwalt, Pennsylvania, Tinctura Strophanthi.
Archibald Alexander Gracey, Pennsylvania, Sarothamnus scoparius.
Joseph Thomas Griffith, Maryland, Decolorized Tincture of Iodine.
Marlborough Hall, Pennsylvania, Erythroxylon Coca.
Samuel Tilden Hamberg, Pennsylvania, Nitroglycerin.
William Handler, Ohio, Syrupus.
Luther Grant Harpel, Pennsylvania, Benzoin.
William Grant Haupt, Pennsylvania, Diastase and Pepsin.
Fred. William Haussmann, Pennsylvania, Orange and Turpentine group.
Chas. Palmatary Hendrickson, Delaware, Tincture of Vanilla.
Frank Augustine Hennessy, Michigan, Lupulin.
George Winters Herbein, Pennsylvania, Percolation.
Daniel Henry Hills, New York, Elixir adjuvans.
William Ellwood Hinkson, Pennsylvania, Piscidia Erythrina.
John Almer Houghton, Utah, Growing evils of pharmacy.
Carrie Emily Howard, Pennsylvania, Women as pharmacists.
Frank Stacker Hughes, Pennsylvania, Salicylic acid.
Henry John Humma, Pennsylvania, Honey.
H. Lewis Hurxthal, Ohio, Codeine.
Charles Pim Jacob, Pennsylvania, Extractum Digitalis fluidum.
Charles Mathias Jager, Tennessee, Panax quinquefolium.
Edwin Leonard Janson, Ohio, Verbasci flores.
William Anthony Johnson, Pennsylvania, The Hypophosphites.
Henry Draper Jump, Delaware, Citrate of Iron and Quinine.
Augustus Herman Keller, Pennsylvania, Syrupus Hypophosphitum cum Ferro.
Ben C. Keller, Iowa, Extractum Dulcamaræ fluidum.
Allen Jesse Kendig, Pennsylvania, The detection of Paraffin in Beeswax.
Harry Milton Kennedy, New Jersey, Coal tar and its products.
Franklin Kern, Pennsylvania, Chloral hydrate.
Frank Kurtz Kitzmiller, Pennsylvania, Adiantum pedatum.
Milton Henry Koons, Pennsylvania, Organic fermentation.
Richard C. Krider, Pennsylvania, Medicinal Wines by fermentation.
William Henry Kunkel, Pennsylvania, Extractum Grindeliæ fluidum.
Charles Lehman, Illinois, Oleate of Mercury.
Charles Neal Leigh, New York, The model Drug Clerk.
Albert John Livingood, Pennsylvania, Transverse sections.
William Loesch, Pennsylvania, Syrupus Acidi Hydriodici.
Sydney Allen Lowry, Pennsylvania, Gossypium herbaceum, its culture and products.
John Sanford Mack, Pennsylvania, Collodium stypticum.
Madison Lovett McCullough, Pennsylvania, Glycyrrhiza lepidota.
John R. McIntosh, Ohio, Phosphorus and its compounds.
William Frederick Martin, Kansas, The successful Pharmacist of to-day.
Charles Borden Miller, N. Carolina, Oleum Olivæ.
Solomon Miller, Maryland, Hydrargyri Chloridum mite.
Mary O. Miner, Kansas, Professional Pharmacy.

Wm. David Moore, Pennsylvania, Potassii bitartras.
Edward Moor, Jr., Pennsylvania, Extractum Buchu fluidum.
John William Morrison, Nova Scotia, Marrubium vulgare.
John Dunaway Mulheron, Tennessee, Strophanthus.
Emmett Leroy Murray, Georgia, Turpentine.
William Moseby Nolin, Missouri, Pills.
Emile Alphonse Perrenot, Pennsylvania, Elixirs, and Syrup of Yerba Santa.
Charles Alfred Pfeiffer, Maryland, Antifebrin.
Geo. Clinton Potts, Pennsylvania, Hydrastis canadensis.
John Nicholas Prass, Ohio, Benzoin and its uses in pharmacy.
Edwin Alfred Prior, Pennsylvania, Adulteration of Glycerin.
Ralph Maynard Read, Pennsylvania, Analysis of Citrullus.
David John Reese, Pennsylvania, Crocus.
Emil Reith, Pennsylvania, Citrine ointment.
Charles Reynolds Rhodes, Pennsylvania, Drug mills.
Gustave Adolph Richter, Pennsylvania, Erythroxylon Coca.
Howard Rohrer, Pennsylvania, Mentha piperita.
Eben Jackson Ross, Pennsylvania, Eriodictyon glutinosum.
H. Frank Ross, Pennsylvania, Glycyrrhiza glabra.
Samuel Geo. Jeremiah Roth, Pennsylvania, Abstracts.
Jacob Albert Rudy, Pennsylvania, Unguentum Bismuthi oleati.
William Ruoff, Pennsylvania, Officinal tests for Lithium salts.
Frank Parke Rutherford, Pennsylvania, Hamamelis.
Joseph Frank Sample, Pennsylvania, Assay of drugs.
Frederick Martin Schick, Ohio, Extractum Cubebæ fluidum.
Harry Ellsworth Schindel, Maryland, Chemical Force.
William Schleif, Jr., Wisconsin, Crystalline principle in Persimmon bark.
Albert Schultz, Pennsylvania, Podophyllum.
J. John Schoff, Maryland, Fermentation.
Leonard A. Schoppe, Missouri, Artificial Gum.
Frederick Abraham Schraedly, Pennsylvania, Oleo-stearate of Mercury.
Theodore William Scott, Pennsylvania, Ipecacuanha.
Edward Parke Sheafer, Pennsylvania, Yerba Santa.
John Peter Sheehan, New York, Explosions and explosives.
Alfred Frederick Schomberg, Pennsylvania, Simple Elixir.
Joseph Frith Shreve, Illinois, Erythroxylon.
William Grant Shugar, Pennsylvania, Fluid Extract of Buchu.
George Walter Sipe, Pennsylvania, Pills.
Albert Webster Smedley, Pennsylvania, Pepsin.
Charles Oscar Smith, Pennsylvania, Gossypium herbaceum.
Fred Harlow Smith, Massachusetts, Fabiana imbricata.
Fred William Smith, Ohio, Facts concerning pharmacy.
Stephen Gregory Snuggs, Missouri, The art of making Suppositories.
Howard Grant Snyder, Pennsylvania, Assayed fluid extracts.
Joseph Louis Sombart, Kansas, Astragalus mollissimus.
Maximilian Sonntag, Pennsylvania, Tincture of Nux vomica.
George Lewis Sontag, Wisconsin, Hedeoma.
Thomas Raibe Southerland, N. Carolina, Starch.

John Stuart Stevenson, Pennsylvania, Syrupus Acidi Hydriodici.
Harry Von Hoff Stoever, Pennsylvania, Hydrastis and its derivatives.
Samuel Martin Strohecker, Pennsylvania, Elixir Quiniæ Ferri et Strychniæ.
Harry Harlan Swainbank, Pennsylvania, Compound Syrup of Benzoin.
Ebenezer Francis Thompson, Pennsylvania, Bitartrate of Potassium.
William Franklin Thompson, Pennsylvania, Compound Elixir of Taraxacum.
Frank Frazier Thomson, Pennsylvania, Ichthyol.
Charles Cowdrick Trauck, Pennsylvania, Extracta fluida.
Herbert Wilkinson Turner, Pennsylvania, Antipyrine.
George Cone Tyler, Pennsylvania, Arsenic.
Thomas Van Dyke Tyler, Pennsylvania, Illuminating gas.
Samuel Elliott Uhler, Pennsylvania, Advantages of manufacturing.
John Adams Van Valzah, Pennsylvania, U. S. P.
Harlan Lewis Wallace, Delaware, Oleite.
Hite Watson, West Virginia, Antipyrine.
Frederick Andrew Weiss, Colorado, Sierra salvia.
Frederick Barton Wells, New Jersey, Pharmaceutical etiquette.
Oscar Connor Welsh, Pennsylvania, Ointment of oleate of copper.
William Custer Wescott, New Jersey, Unfermented grape juice.
Herman Westphal, Germany, Native Wyoming soap.
Martin Inventius Wilbert, New York, Aluminii acetas.
Daniel Albert Williams, Pennsylvania, Erythroxylon Coca.
John Elmer Wishart, Pennsylvania, Extractum Jalapæ alcoholicum.
Albert Elam Ferree Witmer, Pennsylvania, Botany and zoölogy.
Frederick Joseph Wolf, Pennsylvania, The effect of heat and light on plants.
Junius Pascal Woodall, N. Carolina, Gossypium herbaceum.
Harry Worrall, Delaware, Betula lenta.
Frank Gerald Yohn, Pennsylvania, Pharmaceutical education and its advantages.
Robert William Zeigler, Pennsylvania, The Pharmacist.

States and Countries represented by the Graduating Class: Alabama, California, Colorado, Dist. Columbia, Ireland, Kentucky, Massachusetts, Michigan, Minnesota, Nova Scotia, South Carolina, Texas, Utah, West Virginia and Washington, each 1 graduate; Georgia, Germany, Indiana, Illinois, Iowa and Tennessee, each 2 graduates; Kansas, Missouri, North Carolina and Wisconsin, each 3 graduates; New Jersey and New York, each 6 graduates; Delaware, Maryland and Ohio, each 9 graduates; Pennsylvania, 100. Total, 178 graduates.

In response to an invitation from the Faculty, the members of the graduating class assembled at the college on the evening of Wednesday, April 16th, and, with the officers and trustees of the college, sat down to a supper, which was served in the spacious museum. Music by the amateur orchestra, singing by the Zeta Phi Glee Club, toasts and speeches closed the exercises at the college in a most pleasant manner.

The Commencement took place at the Academy of Music on the evening of April 17, the members of the graduating class wearing collegiate caps and gowns. During the session, they had made application to the Board of Trustees for permission, which was granted, with the provision that if the class adopted the cap and gown, they should be worn by every candidate present. President Charles

Bullock conferred the degree of Graduate in Pharmacy, Ph.G., upon the candidates named above, after which the Dean announced the names of the students who, at the examinations, had earned honorable mention with the grade distinguished: J. W. Morrison and Wm. Schleif, Jr.; and with the grade meritorious: E. G. Eberhardt, W. Handler, F. W. Haussmann, M. L. McCullough, J. J. Schoff, T. W. Scott, H. G. Snyder and M. I. Wilbert. The Henry C. Lea Prize, $100, for the most meritorious researches recorded in the graduating dissertations, was equally divided between E. G. Eberhardt and J. W. Morrison. The Pharmacy Prize, a gold medal, offered by Prof. Remington for original pharmaceutical work, was awarded to C. C. Trauck, with honorable mention of S. E. Uhler, S. G. Snuggs, F. M. Apple, G. C. Boecking and F. Dunning. The recipient of the chemical balance, offered by Prof. Sadtler for original quantitative analysis, was R. G. Dunwody, with honorable mention of E. G. Eberhardt and J. W. Morrison. The Analytical Chemistry Prize, $25, offered by Prof. Trimble for original chemical work not in connection with the thesis, was carried off by E. G. Eberhardt, honorable mention being made of R. G. Dunwody. Mr. Eberhardt also received the John M. Maisch Prize of $20, in gold, offered by Mr. J. H. Redsecker, of Lebanon, Pa., for histological knowledge of drugs, honorable mention being made of F. M. Apple, W. D. Barnard, P. N. Duff, W. Handler F. W. Haussmann, C. M. Jager, W. A. Johnson, M. L. McCullough, J. R. McIntosh, J. W. Morrison, W. Schleif, T. W. Scott, H. G. Snyder, H. H. Swainbank and M. I. Wilbert. G. D. Feidt received the Operative Pharmacy Prize, offered by Mr. E. L. Boggs, of Charleston, W. Va., $25 in gold, and honorable mention was earned by Mrs. M. O. Miner, A. Schultz and J. J. Bilheimer. The prescription balance, offered by Mr. H. J. Maris for the best examination in theoretical pharmacy, was awarded to L. A. Schoppe, with honorable mention of T. W. Scott, F. A. Hennessy, F. H. Smith, J. M. Allen, S. M. Strohecker and F. G. Angeny. The last prize awarded was the gold medal offered by Mr. James Robinson, of Memphis, Tenn., for proficiency in chemical knowledge and analytical work. E. G. Eberhardt was the recipient of it.

The Valedictory Address was delivered by Prof. Remington, as follows:

Graduates.—The words which you have heard this evening from the President of the College, publicly proclaiming your fitness to practise your profession, are indeed welcome words to you; your friends who fill this vast auditorium are here to testify to their regard for you, and to exhibit their appreciation of the qualities which you have shown during your laborious time of probation.

The last four years of your lives will probably be remembered in the future, as years filled with toil, self-denial, tribulation, and disappointment; but this hour will forever stand out sharp and clear on the horizon of your memories filled with "happiness o'erflowing and joy supreme."

To attempt in the few minutes, that remain of our official relations as instructor and student, to force you to listen to hackneyed advice and well-worn platitudes is not my intention; in times of exultation and unalloyed pleasure the healthy mind rejects everything but roseate-hued prospects; it is futile to predict disaster or failure, and oracles and seers who see aught but glowing successes in the future are relegated to obscurity.

But this grand old College, which has nurtured and adopted you, is true as steel, for whilst she can share in your enthusiasm with a full heart and bid you rejoice and be merry, for now is the hour of your triumph, she can also say to you "*Festina lente.*" Her wisdom goes hand in hand with her love, and not one of the ten thousand students who thronged her halls during the last seventy years can be found who will fail to accord to her the palm that she deserves for honest faithful service in training her sons and her daughters.

Your commencement in pharmacy occurs at an auspicious time. You enter the business (for it is a business as well as a profession) at a time of depression; when sharp competition has forced many who are incapable or ignorant out of its ranks; you hear on all sides the most gloomy predictions regarding future prospects, and notwithstanding the unusual and unconventional nature of the statement, I utter it fearlessly, that these circumstances make the time auspicious for one beginning pharmaceutical life.

You will receive your training in financial management during a period of forced economy; safe, conservative business maxims, which the prudent and experienced never neglect even in times of inflation, will appear to you now as worthy of being carefully followed; if they are duly heeded by you now, at the outset of your career their value will soon become apparent, and you will insensibly be drawn into moderate and correct habits of life and thought and you will be able then to better withstand the "shock of prosperity," which will surely come to you sooner or later if you begin in this way; let your minds rest for a moment in contemplating the career of those of your friends who have gone before. Cannot most of the failures be traced to inability to withstand the temptations of a little prosperity; for with it, how often comes exalted ideas for the future, extravagant expenditures and wild dreams ending in disaster. Caution, conservatism and industry are absolutely necessary in these perilous times, and as they are attributes, which the successful pharmacist must always possess, either in adversity or prosperity, it follows as surely as "light does the day" that you have nothing to lose by adopting these, but everything to gain.

What is to be your future in Pharmacy? In these days of specialties it is common to strictly limit the usefulness of active agencies to their own sphere, with the object of concentrating labor and developing the greatest excellence; the apostles of this creed would probably argue that the objects of the existence of the Philadelphia College of Pharmacy were thoroughly realized when your hands had been trained to spread plasters, roll pills or make an assay, or when the gray matter of your brains had absorbed sufficient pharmacy to decipher correctly a badly-written prescription or write a learned essay on the correct method of differentiating medullary rays from fibro-vascular bundles; but I can assure you, graduates, that the foundation upon which the superstructure of this College is reared, are broader and deeper than this; her aims are to elevate Pharmacy and to inculcate correct views of professional duty.

The "Philadelphia College of Apothecaries," which, upon being chartered in 1822, became the Philadelphia College of Pharmacy, declared the object of its existence to be for the purpose of cultivating, improving and making known a knowledge of Pharmacy, its collateral branches of science and the best

modes of preparing medicines and compounds, and of giving instruction in the same by public lectures, and the code of ethics subsequently adopted by the College, opens with the following preamble:

"The pharmaceutical profession being one which demands knowledge, skill and integrity on the part of those engaged in it, and being associated with the medical profession in the responsible duties of preserving public health and dispensing the useful though often dangerous agents adapted to the cure of disease, its members should be united on some general principles to be observed in their several relations to each other and to the medical profession and to the public. The Philadelphia College of Pharmacy being a permanent incorporated institution, embracing among its members a large number of respectable and well-educated apothecaries, has erected a standard of scientific attainments, which there is a growing disposition on the part of candidates for the profession to reach, and being desirous that, in relation to professional conduct and probity, there should be a corresponding disposition to advance, its members have agreed upon the following principles for the government of their conduct."

Most excellent recommendations follow for the guidance of the members of the College, and the principles which are to be disseminated are most clearly expounded. The 7th clause of the Code raises aloft the banner of "purity and honesty" in the pharmaceutical products as follows: "As the apothecary should be able to distinguish between good and bad drugs, in most cases, and as the substitution of weak or inert drug for an active one may, negatively, be productive of serious consequences, we hold that the sale of impure drugs or medicines, from motives of competition or desire of gain, when pure articles of the same may be obtained, is highly culpable, and that it is the duty of every honest apothecary or druggist to expose all such fraudulent acts as may come to his knowledge. But in reference to those drugs which cannot be obtained in a state of purity, we should, as occasion offers, keep physicians informed of their quality, that they may be governed accordingly."

This College, even at the beginning of its career, regarded it a crime to acquire knowledge with the intention of using it to feed the monster avarice at the expense of the health and lives of the sick and suffering; and as technical knowledge of a high order is necessary to detect adulterations, and as the public generally are unable to recognize frauds and substitutions, there is usually no protection and nothing to stand between danger and safety, disease and health, villany and integrity, but the high character of the pharmacist, and what a priceless jewel this is.

> The Stoic was not wrong;
> There is no evil to the virtuous brave,
> For in the battle's rift, or on the wave,
> Worshipped or scorned, alone or mid the throng,
> He is himself—a man: not life's nor fortune's slave.

It will thus be seen, Graduates, that, in avowing to-night allegiance to your Alma Mater, you have assumed no light responsibility; for although you are not members of the College, you are Graduates, and in accepting her Diploma you become her children, and her honor is henceforth in your hands. We cannot believe that one of you who has toiled faithfully during these long years to

acquire this knowledge intends, when out of the reach of her fostering care, to misuse it, to throw away great opportunities, and to bring disgrace to her escutcheon.

An old English poet has said :

> Knowledge, when Wisdom is too weak to guide her,
> Is like a headstrong horse, that throws the rider.

And now we send you forth on your mission with confidence and trust, in the full belief that you are thoroughly instructed in your life's calling ; you will separate to-night and will soon realize to the full, the sweetness and power of that place in your hearts so dear to all of you, "home." Some of the faces of your class-mates that are so happy to-night and that you have learned to love, you will never see again, the scene of your life's work will probably be thousands of miles from that of your friend who has stood by you shoulder to shoulder in your labors in this city of Brotherly Love ; but it makes no difference how far you may be separated from those who know you and care for you, nor how great your trials may be ; there still lives one, whose watchful care never tires, whose heart will ever beat in sympathy with yours in your earnest aspirations for light, and in parting with her loyal children to-night, she bids you one and all to ever cherish the memory, the precepts, the example of the Philadelphia College of Pharmacy. Farewell.

As usual the Commencement exercises were interspersed with music, and closed with the distribution of the floral and other presents sent by friends for a number of the graduates. We are pleased to note the fact that this custom of the public distribution of friendly presents continues on its rapidly-declining scale, and it appears to us that the time is near at hand when the example set by other institutions should be followed, of confining such distribution to the green-room.

EDITORIALS.

The present number of the JOURNAL contains 64 (instead of 48) pages, to make room for an account of the exercises connected with the annual examinations and commencement. The amount of original papers and of other matters, which should not appear later than the May number, is such that we have been compelled to defer, until June, the publication of several papers, of chemical notes, abstracts and of Association notices.

Standardization.—During the past few years the editor has made no comments on the discussion upon this subject as carried on by medical and pharmaceutical journals, in the hope that some positive proofs might be forthcoming demonstrating the asserted superiority of standardized preparations of vegetable drugs over such made in the customary way from the same drugs well authenticated according to the Pharmacopœia. Such proof has not been produced, nor has it been shown that standardized preparations vary less in the percentage of the leading therapeutically active constituent than does the properly selected drug. In another place we show the reason why, in certain cases, the Pharmacopœia had to adopt processes of assay, and to what extent they had to be carried in order to produce entirely trustworthy results. The propositions thus far made for the extension of the principle introduced into the Pharmacopœia thirty years ago, lack, in our view, those features of exactness which are observed in the processes adopted in the last edition, though it

is not, and need not be, claimed that these processes were not susceptible of improvement.

It will thus be seen that this is one of those important questions in which different persons are likely to honestly differ in opinion, and there is no need of charging incompetency or sinister motives to the advocates of either plan, who may discuss the question from the standpoint of the physician or of the pharmacist, and not from that of the manufacturer who from his special facilities, is obviously interested in the decision of the problem in one way.

Physicians and pharmacists are agreed that medicines should be as definite as possible. We think that the weight of pharmaceutical experience, and also of chemical determinations, is not in favor of the movement, certainly not on the scale proposed in some quarters. Whether physicians really do want such preparations, is for them to determine; not for the few, but for those who can with authority speak for the profession of the country; but, whether adopted by the Pharmacopœia or declined, whether the old-fashioned tinctures, etc., be standardized or a new class of preparations be introduced, the honest wants of the physician will always be supplied by the reputable pharmacist.

The papers printed in the present number do not present all the arguments that may be advanced either in favor or opposition of the measure in question, but they probably give the strongest and most prominent points on both sides, and as such, it is hoped, they may be found useful in arriving at a final conclusion.

Renewal of Registration in Pennsylvania.—The following notice, which has just been issued, is of especial interest to the pharmacists of Pennsylvania:

The State Pharmaceutical Examining Board of Pennsylvania hereby gives notice that registration under the Pharmacy Act of 24th May, 1887, must be renewed every three years.

The registration of all persons who were registered during the first period of ninety days, by reason of having been engaged in the retail drug business in Pennsylvania at the date of the passage of the Pharmacy Act, will expire between August 13 and November 18, 1890.

All persons who are registered under this act, either by reason of having been engaged in the retail drug business when the act was passed, or under section eleven, or by examination, should apply to the Secretary of the Board for renewal of registration *about ten days before the expiration of three years from the date of their certificate*, and enclose the fee of one dollar.

As the act contains no provision for *days of grace* in applying for renewals, such applications must be promptly made, as stated in the foregoing paragraph, or the registration will be forfeited.

In applying for renewal of registration, give number of certificate and state whether Registered Pharmacist or Qualified Assistant, *but do not return the certificate*. Give name and address in full, and also address when first registered, if any change has been made.

Alonzo Robbins, President, Philadelphia.
H. B. Cochran, Secretary, Lancaster.
F. H. Eggers, Allegheny City.
A. J. Tafel, Philadelphia.
A. B. Burns, Montrose.

Lancaster, April 21, 1890.

Pharmacopœial Weights and Measures.—The following circular explains itself, and deserves the careful unbiassed consideration of every pharmacist and physician. It is addressed to the professions of medicine and pharmacy, and the medical and pharmaceutical colleges of the Unites States and Canada:

At the last meeting of the *American Association for the Advancement of Science*, held at Toronto, Can., September, 1889, the undersigned were appointed a committee to promote the use of the metric system of weights and measures among professional men, and especially to secure its more general adoption by the physicians and pharmacists and the chemical and pharmaceutical manufacturers of our country.

The metric weights and measures were legalized in this country by Congress in 1866, and are now in actual use by most students of natural history, by some scientific periodicals, by the graduates of our schools of civil and mining engineering, and especially by all scientists and chemists throughout the world, without regard to their mother tongue. It is nevertheless greatly to be regretted that a large majority of our physicians, pharmacists and druggists still continue to ignore its merits or discountenance its adoption.

The merits of the metric system have been so thoroughly recognized that it is adopted by most civilized nations. Further argument should be unnecessary to secure its universal adoption in our hemisphere, where it is already in exclusive use by all the states of Southern and Central America.

It is a strange and irreconcilable fact, that the Governments of Great Britain and the United States, or the English-speaking peoples, should stand quite alone in their stubborn and persistent adherence to the use of heterogeneous standards of weights and measures, completely devoid of system in themselves, or of any practical and rational relationship to each other. And it is especially strange, in view of the practical utility of the metric system, that the professions of medicine and pharmacy in this country should in this respect at the present time, be behind the various arts of engineering, as must be conceded by those familiar with the facts.

This condition of things is not due to any inherent defects in the system itself, but to indolence and a want of practical acquaintance with the metric system which largely amounts to positive ignorance, that is unjustifiable, since it hinders the próper assimilation of the great mass of scientific literature in which the system is exclusively used, tends to increase the risk of errors in our professional work and imposes much unnecessary labor on the student.

The educated representatives of medicine and pharmacy in this country favor and would gladly adopt the metric system, but find their efforts in this direction constantly hampered and nullified by the opposition of a large number of both professions who, through conservatism or lack of education, fail to unite in any concerted effort for its more general adoption and use.

It is unnecessary here to expatiate on the advantages of the metric system of weights and measures. The identity of the single factor with our system of numeration, the perfect correspondence between measures of weight and capacity, its approval by a large majority of the nations of the world, and especially its actual use by scientists and chemists without exception, render its ultimate adoption by all arts dependent on natural sciences and especially by medicine and pharmacy, a matter of necessity and certainty. Its adoption is

not to be viewed as an experiment as would be such modifications of our present forms as have been proposed by some individual enthusiasts and which have received but little consideration by any but their inventors.

The argument that our system of weights and measures is the same as that in use in Great Britain, with whom we have most intercourse, is without foundation. The system we use is well called the *American system*, for no other nation uses it. The *Troy* pound has been abolished in Great Britain, and no longer appears in their text books and the fluid measures are different in the proportion of 4 to 5.

If identity is to be preserved between our measures and those of any other nation, some change must be made, and we believe there is substantial unanimity in a preference for the metric system as in place of our old system if any change is made.

It is wholly unnecessary to defer the adoption of this much-needed reform until the prejudices, fallacious arguments, or educational deficiencies manifested by a large contingent of pharmacists and physicians shall have been overcome. Such a period must necessarily be remote, and indefinite, while the method herein proposed avoids any delay. The difficulty of securing any change on the part of men already in active business is well shown by the fact, that the simple innovation in the present U. S. Pharmacopœia of expressing quantities in *parts by weight*, demonstrates how large a number of pharmacists are incapable of comprehending so simple a relationship when applied to the complicated empirical and antiquated systems of weights and measures in present use.

One of the principal reasons why the metric system has not yet been adopted in this country by professional men, is the indifference shown by our professional schools. Every student of medicine and pharmacy is practically obliged to learn a system of weights and measures new to him when he begins professional study. He may have learned the Apothecary tables in his school days, but he has not used them, and as elements of thought the grain and drachm are entirely new to him. If the gram and cubic centimeter are substituted for them, no additional labor is entailed upon the student. It must not be supposed at the present time, that professors who are really competent, are ignorant of this system, and hence this change would not entail any additional labor on the professors. In fact it would diminish the labor, of both professors and students, for in medical schools at the present time, instruction is given in both systems, and it would simply make the methods of instruction uniform in the chairs of materia medica, pharmacy and chemistry, where now is a confusion.

The Pharmacopœia does not now recognize the Troy system, and if the doses were taught in metric terms only, the old system would die out with the passing off of the present generation of practitioners. No inconvenience would be caused to any one, those who are too old to learn, could go on using their present mode, and the new graduates would use that which they are taught.

It should be particularly remembered that we are not trying to introduce a new system, but to drop an old one, which is as irrational and unscientific as any other relic of barbarism. *It is especially opportune at this time when a*

new revision of the Pharmacopœia of the United States is pending, that the Committee of Revision, as well as the Pharmacists, Druggists, and Physicians of this country, should have their attention particularly directed to this important subject. For the use of these professions, six lines contain all that is necessary, as follows:

1,000 milligrams make one gram.
1,000 grms or cubic centimeters make one kilo, or liter.
1,000 kilos make one ton.
65 milligrams make one grain.
15½ grains make one gram.
31 grams make one ounce Troy.

In writing prescriptions, a vertical line should be drawn between grams and milligrams, all figures on the left read grams, all on the right to three figures, respectively deci-, centi-, and milligrams.

Chemists think in milligrams and grams only, and pharmacists and physicians may do likewise, reducing our system to two denominations only. In the arts the milligram is not divided.

As the metric system is legal throughout the United States any physician is entitled to present a metric prescription to the druggist. All boards of examiners in medicine and pharmacy, whether state or collegiate, are justified by law to exact, and *should demand from every candidate for graduation or for a license a knowledge of the metric system.*

We also earnestly recommend that Schools of Medicine cease to give instruction in the apothecary system of weights and measures for which there is no longer any reason, and that in the Schools of Pharmacy the merits of the metric system should be presented with the prominence that its utility, and the near prospect of its adoption justify, in the best way to secure its immediate use as the exclusive system of weighing and measuring in medicine and pharmacy, and in the manufacturing arts correlative with them. And for the further promotion of this object, we recommend that an addition be made to the pharmacy laws now in force in most of our States, prescribing that all persons receiving a license to sell drugs and dispense medicines shall be required to provide themselves with a set of metric weights.

Prof. Wm. H. Seaman, Washington, D. C.
Dr. Fred. Hoffmann, New York.
Prof. Robt. B. Warder, Washington, D. C.
Committee A. A. A. Sc.
Prof. T. C. Mendenhall, *Presid. A. A. A. Sc.*

April 15, 1890.

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JUNE, 1890.

MARRUBIIN AND FLUID EXTRACT OF MARRUBIUM.

By Frederick G. Hertel, Ph.G.

Abstract from an Inaugural Essay.

In some localities horehound beer is used, for the preparation of which it was ascertained, horehound, ginger, Irish moss and liquorice are employed.

Of pharmaceutical preparations which are in popular use, the fluid extract and syrup of horehound and horehound candy are most frequently employed. On making a fluid extract of horehound using ten pounds of the ground herb, and diluted alcohol for extracting it, it was noticed that after standing about a week, a deposit of well-defined crystals separated from the finished extract. When heated on platinum foil the crystals melted, then charred and finally volatilized without leaving any residue. They were quite soluble in chloroform, alcohol and ether, and slightly soluble in water. The principle is insoluble in benzin, is not colored by acids, does not respond to Fehling's test for sugar, nor to the alkaloidal group-reagents, and from its alcoholic solution is not precipitated by lead subacetate. The slight yellow color of the needle-shaped crystals was removed by several recrystallizations from alcohol; they retained their slowly developing but persistently bitter taste. The deposit from the 10 pounds of herb amounted to nearly one ounce, and the fluid extract appeared to be as bitter as before. By precipitating the fluid extract with basic lead acetate, filtering, treating with H_2S and concentrating the filtrate, more crystals were obtained.

The *National Dispensatory* states that Harms obtained 30 grains of marrubiin from 25 pounds of the herb; but neither his process nor

that devised by Kromayer, both starting with an infusion of the herb, appear to be the best that can be devised, owing to the sparing solubility of the principle in water.

From the observations made it is obvious that diluted alcohol is not a suitable menstruum for the preparation of the fluid extract. Using a liquid composed of 2 parts of water and 3 parts of alcohol with 5 per cent. of glycerin, the deposition of crystals commenced even before the fluid extract was finished. A menstruum prepared from 2 parts of alcohol and one of water with 5 per cent. of glycerin yielded a fluid extract remaining free from crystalline deposit.

It should be stated yet that marrubiin crystallizes best from cold alcohol; the crystals from hot alcohol are less compact, and ether and chloroform evaporate too rapidly to permit of the formation of handsome crystals.

OLEUM PEPONIS.

By Louis Augustus Minner, Ph.G.

From an Inaugural Essay.

Two samples of oil of pumpkin seed were procured, one each from New York and Philadelphia. Only insufficient information could be had as to their mode of preparation. They were of a pale yellow color and became semi-solid at 32° F. One sample had considerable of a deposit resembling lard in color and consistency, and was rather freely soluble in alcohol. Both oils were administered for tænia, in the form of emulsions and in doses of half an ounce, followed by a dose of castor oil, without expelling the tape worm. The same quantity of the oleoresin of pumpkin seed ejected promptly large portions of the tænia.

For preparing this *oleoresin* the seeds were reduced to a coarse powder by triturating them in a mortar with pumice stone, exhausting with ether by maceration and percolation, and evaporating the solvent at a gentle heat. After washing the oil with some alcohol it formed a thick liquid of a red color, had a peculiar unpleasant odor and a disagreeable rank taste. Its specific gravity at 60° F. is about 0·924. It is almost insoluble in alcohol, soluble in chloroform, ether, benzin and benzol, and does not congeal at 32° F. Strong sulphuric acid changes the color to green, then dark green, and after several hours to a dull red-brown, a blackish deposit

being also formed. Strong nitric acid changes to red-brown, and after about 5 minutes causes violent effervescence, a disagreeable odor being given off, and after cooling a reddish-brown semi-solid mass is left.

Pumpkin seeds are not as frequently used as they would be if they could be administered in a more convenient form. The introduction of a reliable preparation seems desirable and, in the writer's opinion, the oleoresin is both a convenient and elegant as well as effective preparation. It can be easily and readily prepared, and is probably the most concentrated liquid form of pumpkin seed that can be devised. It may be given in doses of ½ to 1½ fluid-ounce, in the form of an emulsion flavored with aromatics.

THE BARK OF PRINOS VERTICILLATUS.

By J. Stewart Smith, Ph.G.

From an Inaugural Essay.

On exhausting 50 gm. of the powdered bark with different solvents the following results were obtained:

	Per Cent.
Extract with petroleum ether,	2·44
stronger ether,	2·07
absolute alcohol,	6·63
water,	5·36
(including 0·23 per cent. ash.)	
caustic soda,	3·99
(after deducting 1·19 per cent. ash.)	
diluted acid,	1·79
(after deducting 2·05 per cent. ash.)	
chlorine water,	1·96
Soluble organic compounds, Total,	24·24

The petroleum extract contained a little volatile oil. The ether extract was entirely soluble in hot alcohol, had a neutral reaction and was free from tannin. The alcohol extract was entirely soluble in chloroform, partly soluble in water with a faint acid reaction, contained tannin, reduced Fehling's solution, and gave with Mayer's reagent a slight precipitate, the nature of which was not ascertained. The powdered bark contained 9 per cent. of moisture and yielded 4·3 per cent. of ash. See also analysis of the bark, by L. C. Collier, in Amer. Jour. Phar., 1880, p. 437.

A NEW SPICE ADULTERANT.

By Frank A. Hennessy, Ph.G.

Contribution from the Chemical Laboratory of the Philadelphia College of Pharmacy.—No. 72.

Read at the Pharmaceutical Meeting, May 20.

Some time ago the attention of the writer was called to some samples of "artificial ground spices" which bore a close resemblance to the pure articles. It was learned that the production of these goods was the result of numerous experiments, and subsequent investigation succeeded in bringing to light a branch of manufacturing industry of no small magnitude, which has for its sole object the production of articles known to the trade as "spice mixtures." The manufacture of these articles is conducted in a large steam bakery in Philadelphia. Samples of the materials used have been secured from time to time, and these are presented with this paper.

The substance which forms the base for all these mixtures, and which is designated in the sample as "meal," was found on inquiry among several millers to be a very low grade of wheat.

It is not known to them by any special name, but might be called "blow-room stuff." It is a little better than feed, to which it is sometimes added to improve the quality, but is a lower grade than middlings. Samples from lots which had been delivered to the bakery at different times were identical.

The meal is made into a dough with water, rolled out and cut in the same manner as soda crackers, and baked in an oven.

These crackers or "biscuits," as they are termed, are then allowed to dry thoroughly when they are ready for grinding.

The different shades are obtained by the use of coloring matters which are mixed with the meal when it is being made into dough.

The "white" biscuit is made from the plain meal without coloring. The "yellow" is made with the aid of turmeric, a little of which goes a great way in imparting a rich yellow hue, such as is peculiar to mustard.

A sample of the coloring matter used in the "brown" biscuits is also presented. An analysis shows this to be a mixture of about equal parts of Spanish brown and turmeric.

Charcoal is used in the "black" biscuits.

Some biscuits having a red color, such as might have been used to adulterate Cayenne pepper, were seen, but it was impossible to secure samples at the time.

Large quantities of these spice biscuits have been delivered to a spice house in Philadelphia, and it is not known that any have been shipped out of the city. As they are all sent to the spice dealers in the whole condition, probably on account of the lack of facilities for grinding, the samples of powders which are presented were ground by the writer in a small drug mill, and may only roughly resemble the powders prepared by the spice millers.

However, they will serve to show how closely the ground spices may be imitated.

The sample labelled "pepper mixture" is made up of the "black," "white" and "brown" powders—the one labelled "clove mixture," of the "brown" and "black."

"Cracker dust" is said by many investigators to be used as a spice adulterant, and a sample of this material from the same bakery is presented, although it has never been used in the manufacture of these biscuits. It consists altogether of stale bread which accumulates in large quantities, and which is thoroughly dried and ground.

An analysis of the spice biscuits gave the following results, the "black" and "white" powders and the original meal being taken:

	White.	Black.	Meal.
Moisture,	7·52	8·27	—
Soluble ash (HCl),	3·	4·98	2·95
Insoluble ash (HCl),	trace	4·45	—
Total ash,	3·	9·43	2·95
Glucose,	14·51	14·51	14·51
Cane sugar,	6·03	3·02	11·02
Residue after treatment with cold H_2O and dried at 100° C.,	75·8	83·2	65·8
Charcoal and matter insoluble in boiling H_2O,	—	54·1	—
Ash of same,	—	15·57	—

The ash consisted of Na, K, Cu, Mg, chiefly as phosphates, with

some sulphates, the insoluble portion of the "black" being fine sand.

It is evident that without the most careful examination, the presence of these mixtures in ground spices might often escape notice.

The starch granules are usually so much altered in the process of baking as to render their identification almost impossible.

As pure ground pepper, for instance, yields:

Moisture,	8–10
Ash,	2–5
Starch,	34–43
Total reducing sugar equiv.,	42–55

It is obvious that in case of admixture with this material, the determination of any or all of those constituents would be of no value, and it is probable that the only reliable results would be obtained from estimating the amount of piperine and resin, which is quite constant.

Some points of similarity to other spices might be mentioned to show how admirably these mixtures are adapted to their purpose: but the object of this paper is simply to call attention to what is believed to be the latest development of inventive genius in this direction.

MICROSCOPICAL EXAMINATION OF POWDERS.

By Hans M. Wilder.

Powders.—Considering the number of histological elements of varying specific gravity which constitute a drug when powdered, and considering the small amount of powder actually present in a "mount" (seldom more than one-half to one grain, generally less), it will be evident that a single slide rarely, if ever, fully represents the drug. It will be necessary, therefore, first to insure the thorough mixing of the powder (either by shaking of the container or by triturating a portion in a mortar), and, secondly, to make about a dozen slides, the examination of which will bear out the above statement. Once, on examining powdered Alexandria senna, the writer made twenty slides before he found the middle layer of the fruit pulp, for an illustration of which see Proceedings A. Ph. A., 1882, p. 240, E.

Medium.—For casual examination almost any liquid will do. Besides the time-honored water and more or less diluted glycerin, the writer finds sweet oil, old essential oils and especially liquefied carbolic acid of great service as clearing media; a concentrated solution of chloral hydrate clears nearly as well as the latter substance.

Mounting.—If the powder is tolerably uniform in fineness and quite dry, so that it does not cake, a very cleanly way of mounting is to follow Mr. A. P. Brown. Breathe upon a slide, press it down on the powder, and rap the slide smartly with the edge on the table so as to get rid of the superfluous powder, when the remainder will be found distributed quite evenly on the slide. The writer now puts on the cover glass, places on top a small weight (a conical rifle bullet, for instance), brushes off the excess of powder, and adds one or more drops of the medium next to the cover glass, when the fluid, if not too viscid, will quickly run under by capillary attraction. This does away with the otherwise inevitable "messing," and comparatively few (sometimes none) air bubbles will be noticed.

In order to make a typical slide, since very seldom a single slide contains all the characteristic elements, the latter must be transferred from several slides to one of them, unless one prefers to keep three or four slides of the same powder.

Comparison.—In order to get a powder of undoubted purity, it is certainly best to powder the drug one's self, and since the volatile parts are of no consequence microscopically, sharp drying will much facilitate the powdering. The pharmaceutical microscopist ought to be sufficiently familiar with the microscopical appearance of the more important powdered drugs to be able not only to recognize them at once, but also be able to state that such and such other elements (tissues) do certainly *not* belong to the drug in question. Whether he is able to tell what these foreign substances are, will depend on his familiarity with the usual impurities and adulterations; it is manifestly impossible to be acquainted with everything that might be present in a powder.

Powdered Rhubarb.—The writer mentioned the use of essential oils as media for the examination of powders, because of their clearing action. On examining a sample of rhubarb in oil of fennel seed

he found that the oil merely brightens the reddish yellow color of the pure rhubarb, without extracting it, while the smallest speck of turmeric was surrounded by a broad halo of bright yellow, besides acquiring itself a purely yellow color. This will be noticed already on mixing the powder with the oil on the slide.

Silicate of sodium as a medium.—The writer has found soluble glass (water glass) to be an excellent medium for permanent mounts, possessing several advantages. It clears well and dries ("sets") very quickly. Scarcely fifteen minutes, after having adjusted the cover glass, the slide may be scrubbed with a nail brush, without dislodging the cover. "Ringing" is not necessary. Its disadvantage is that sooner or later flakes appear here and there in the mount, this may be obviated by adding glycerin in the proportion of 1 volume of glycerin to 4 volumes of soluble glass (but then it takes a longer time to dry); the mixture at first quite turbid, clears very soon. Another disadvantage is that after some time it becomes next to impossible to remove the cover glass, and when removed, the slide will be found roughened. Soluble glass is incompatible with acids (even very weak), alcohol, ethereal liquids, collodium, essential oils, carbolic acid, gum arabic mucilage, all of which precipitate the silicic acid in the well-known gelatinous form. Its alkalinity will, of course, cause it to alter the shade of most of the stains—carmine, for instance, gets an orange shade, and the purplish-blue color of hæmatoxylin stain turns sepia-brown —and color lignified tissue more or less yellow; but this is not exactly a disadvantage.

Dark colored powders may be rendered a good deal lighter in color (some quite bleached) by a 24 hours' previous maceration in moderately strong water of ammonia and subsequent washing with water; as far as can be judged, no alteration beyond the removal of color takes place, not even the individual starch grains are altered by this treatment.

Fineness of Powder.—In conclusion the writer would call attention to the fact that the three different degrees of powder in commerce—very fine, fine and moderately coarse—quite seldom give identical slides. In "very fine" are often found structures which are mostly wanting in "fine" and especially in "moderately coarse" and *vice versa*. There are, though, several firms who make a point

of letting each degree of fineness represent the *whole* drug, and who are not content with grinding "moderately coarse," separating the finer powder by sifting. A truly representative powder for percolation, for instance, can not well be of a uniform grain; it must needs contain more or less "fine" powder.

SOME INDIAN FOOD PLANTS.

IV.—Peucedanum Canbyi, COULTER AND ROSE.

By HENRY TRIMBLE.

Contribution from the Chemical Laboratory of the Philadelphia College of Pharmacy.—No. 73.

Read at the Pharmaceutical Meeting, May 20.

The following report of this plant has been forwarded by Dr. V. Havard, U. S. Army Surgeon, at Fort Buford, N. Dakota. It is known as "Chucklusa" by the Spokane Indians:

"Of the nine or ten species of Peucedanum which are bulbiferous in North America, the bulbs of this species, in size and flavor, are probably the best, or certainly among the best. They are preferred to those of any other plant by the Spokane Indians, the Camas excepted.

"The Chucklusa is a native of Washington and Oregon. It does not appear to be much diffused and has only been reported from a few localities.

"It is from 3 to 8 inches high, with a short underground stem from a thickened, more or less elongated, rootstock which ends in a solid tuber; leaves finally dissected into short segments; umbels 5 to 10-rayed, the white rays 1 to 2 inches long; fruit with narrow wings, ovate-oblong, 4 lines long, and half as wide.

"The bulb, buried 3 or 4 inches under ground, is globular in shape; the transverse diameter from ¾ to 1½ inches and slightly exceeding the vertical diameter. It is covered with a black epidermis, easily rubbed off, and entirely made up of a white farinaceous mass with a granular, homogeneous texture. In taste it is very pleasantly palatable with a slight aromatic flavor. It is eaten either raw or baked, and often pounded into flour from which a nutritious and wholesome bread can be made."

An analysis of the chucklusa, sent me by Dr. Havard, gave the following results:

	Per Cent.
Starch,	17·02
Albuminoids,	3·25
Glucose,	1·24
Saccharose,	10·66
Mucilage,	15·34
Dextrin,	·40
Resin,	2·57
Fat and wax,	2·12
Ash,	4·20
Moisture,	7·90
Cellulose and undetermined,	35·30
	100·00

Tannin was not found, but a small quantity of chlorophyl appeared to exist in the black epidermis. While this food is not so rich in albuminoids as some of its predecessors, it was found to be more palatable, due, no doubt, to the saccharine carbohydrates

SOME NOTES ON GINSENG.

By P. L. Simmonds, F.L.S.

The trade in this root is of some importance from the export carried on in the North American species, *Aralia quinquefolia* (Decaisne and Planchon) *Panax quinquefolia*. That of China and Upper India is the produce of another species, *Aralia* (*Panax*) *Ginseng*.

I have not the latest statistics for reference of the American exports, but I find from the official figures that the shipments were as follows in the years named:

	lbs.		lbs.
1870,	474,316	1875,	497,487
1871,	144,221	1876,	550,424
1872,	401,260	1877,	440,406
1873,	350,141	1878,	421,395
1874,	400,619		

The export value is not given, but I have seen it stated at as much as £100,000 annually; this I fancy is too high a figure for the general average.

In China and Japan the roots of ginseng, wild and cultivated, are considered a sort of panacea or specific for all diseases. They are

bitter, tonic, stimulant, and believed to be aphrodisiac. The Chinese consider it a most powerful and life-preserving medicine, hence the enormous retail price attached to a worthless drug. It sells at 7 dollars a catty (of 1⅓ pounds) or about 28 sh. per pound. The Chinese consider the Japanese ginseng inferior to that from Mandchouria and Corea. The last is the best and whitest, selling at 30 dollars a catty.

The imports of ginseng in the port of Shanghai in 1882 were to the value of 356,309 taels, or about £89,100.

In the five years ending 1872, the average annual import of ginseng into China was 3,700 cwt. In 1887 it was rather more, 4,975 cwt., valued at £181,800. The extent of the home production there are no means of ascertaining.

Old ginseng is imported from Japan. American comes through Singapore. Bastard ginseng is worth only 80 dollars a picul (1¼ cwt.).

Resinous ginseng, received from Suchon-fu, in the province of Kiansu, is prescribed in hematesis, epistaxis and dysentery. When ginseng is taken, it is given in decoction of 1 to 12 gram, for five or six days continuously, the patient abstaining from tea for about a month. Crude ginseng is the natural dried root; the clarified is rendered translucent by steaming, skimming and drying the fresh root. The finest is reserved for the Court at Pekin, and considered more valuable than its weight in gold.

In Japan Panax Ginseng (called Nindzin) is often cultivated in the environs of Hakodata (Isle of Yeso). That collected at Ningkoola is reserved for the use of the Emperor and his family.

In Japanese medicine the roots of Aralia edulis or cordata, known as Udo, are prescribed in heart disease, uterine affections and for stopping hemorrhages. In China this species is prescribed as a tonic in menstrual, chlorotic and puerperal diseases of women. It sells at 30 dollars a picul.

In Japan there is much fraud carried on in ginseng. It is mixed with the roots of Platycodon grandiflorum, Campanula glauca, Adenophora verticillata, and a species of Convolvulus root. Another fraud consists of redrying the roots that have been used and sending them again into commerce.

Bastard ginseng is Panax amerigo, which is reclarified in Canton

for export. The sun-dried root of the Convolvulus is used as a cheap substitute for true ginseng and prescribed in cases of spermatorrhœa, debility and severe dyspepsia.

A CONTRIBUTION ON SCOPOLA CARNIOLICA.

By J. B. Nagelvoort.

It seems to me that there is no necessity for the reasoning of the *Pharm. Centralhalle* in its No. 7, 1890, p. 88, on this subject. In case the rhizoma *Scopolæ carniolicæ* contains a valuable amount *of hyoscyamine* and not in very variable quantities, the drug will be used, if not in medicine, then in chemical factories.

Prof. Flückiger wrote in his *Pharm. Chemie*, 1888, about Scopola japonica and sanctioned with his authority the presence of mydriatic alkaloid in the plant. No English or American journal had anything to do with it.

I refer to the February number of this Journal and to the *Arch. d. Pharm.*, 3, 1890, for the leading points. Desire only to offer for record a corroborative experience.

A quantity of scopola rhizome, derived from Germany through the common channels of commerce, yielded 0·5 per cent. *hyoscyamine.*

Laboratory of Parke, Davis & Co.,
Detroit, May, 1890.

TURPENTINE.

By R. Gaillard Dunwody, Ph.G.

Contribution from the Chemical Laboratory of the Philadelphia College of Pharmacy.—No. 74.

Turpentine is an oleoresin of a white semi-solid consistency which exudes from *Pinus palustris* and other species of the pine family when incisions are made. The trees are indigenous to the Southern States from Virginia to the Gulf of Mexico. Their usual height is from seventy-five to eighty feet, two-thirds of which are from eighteen to twenty inches in diameter and destitute of branches; the other third is branched having leaves of a dark green color about ten to fifteen inches in length situated at the ends in clusters of three, surrounded by long ragged sheaths. The bark is dark brown and has a revolute and longitudinally-fissured cork. Pines growing near swampy localities produce more oleoresin, and have

longer leaves of a darker green than those grown in the interior, and are distinguished as *pitch pine*, *longleaf pine* and *yellow pine*.

Turpentine is manufactured in the following manner:

Boxes, as they are called by the manufacturers, are cut into the trees from the first of December until the middle of March; usually from one to four are cut in each tree according to its size. The boxes are made twelve inches above the ground so that the lower lip is five inches, and the arched upper lip eight to ten inches above the bottom of the box, extending into the tree a short distance; they usually hold from half to one gallon. The tree is then left from two to three days, when the bark is removed about three to four or sometimes ten feet above the boxes and the tree is scraped or hacked triangularly. The instrument used for scraping is made of iron the shape of the letter L with a ball attached to the long arm, the operator taking hold just above the ball, the weight of which aids in scraping.

The oleoresin begins to run about the first of March, and flows best during June, July and August, decreasing as cool weather begins to approach. The trees have to be slightly scraped about every ten to fifteen days to remove the oleoresin which has become solidified preventing the flow.

Boxes are dipped every eight to ten days with a peculiar constructed instrument called *turpentine dipper*. The oleoresin is first put in buckets and then transferred to barrels on the wagon, their heads being removed until filled, when they are wedged on tightly: the barrels are then carried to the place of distillation.

A still made of copper is set into a brick furnace, which is from ten to fifteen feet in length, five to six feet in width and about eight feet in height. The still usually holds between fifteen and twenty barrels of the "crude." With the "crude" a little water is added, then the still is warmed so as to make the chips and straw rise to the surface to be skimmed off; a little more water is now added and the top luted on and connected with a large condensing worm placed in a large tank kept filled with cold water. When all the joints have been made tight, heat is applied strongly; the water having a lower boiling point than the oil begins to come over first bringing over a small quantity of oil which is gradually increased and is condensed and run into a barrel previously placed at the end of the

condensing worm. Water has to be added during distillation to aid the oil in coming over, also to keep the mass from becoming too thick and charring. Some manufacturers distil the "crude" without any water only what is dipped up with the "crude," but there is danger in burning the residue.

In the receiving barrel the oil having a lighter specific gravity floats on top of the water and is dipped off. This constitutes the commercial Spirits of Turpentine. The residue in the still after all of the water and oil has stopped coming over, is resin, which is run out through a faucet at the side of the still, having three strainers attached to it, into a long trough communicating with barrels which hold between three and four hundred pounds. This constitutes the commercial *resin*.

The first exudation of the tree is the best and is distinguished by the name *virgin dip*, the resin being of a light amber color, transparent, brittle, and melting at 75° C. Resin which is translucent contains too much oil and is very brittle.

The color of resin becomes darker after each exudation of the tree until it finally becomes almost black, yielding little oil and decreasing in value a great deal.

For many years North and South Carolina furnished the above products; but of late years Georgia and some of the Gulf States have been yielding a great deal.

Turpentine Oil, $C_{10}H_{16}$, is a colorless mobile liquid of an aromatic odor when freshly distilled, the specific gravity between 0·850 and 0·880, and boiling between 161° and C. 165° C. It mixes with absolute alcohol, ether, and carbon bisulphide in all proportions, is insoluble in water and slightly soluble in aqueous alcohol. It dissolves sulphur, phosphorus, fixed oils, resins and many other organic compounds. It absorbs chlorine gas with elevation of temperature sufficient to produce ignition, provided the temperature is not kept down with cold water. When iodine or nitric acid is brought in contact with turpentine oil an explosion will be produced. Hydrochloric acid gas passed into turpentine oil is absorbed with elevation of temperature, forming the compound $C_{10}H_{16}HCl$. The gas must be very dry; the drying flask as well as the turpentine oil should be kept cool (6–7° C.) and the gas should bubble through a long column of turpentine oil. A crystalline compound, known

as artificial camphor, is then usually obtained in three or four hours; another compound remains oily and is dark colored.

It is thought, of recent years, that the commercial oil of turpentine, is much adulterated with petroleum.

In order to determine how far this is the case, I obtained eight samples from the market in Philadelphia and three from manufacturers in Georgia to all of which the following tests were applied. The rotary power was determined in a 200 mm. tube, and all were found to rotate the ray of polarized light to the right before and after rectifying by distillation.

The specific gravity was taken at 15° C., before and after distillation. The temperature was carefully noted at the beginning of the boiling, and in the following table the last two columns give also the temperature at which most of the oil came over, and the temperature reached at the end of the distillation:

Samples.	Rotation		Specific Gravity.		Boiling Point.		
	before	after	before	after	Beginning.	Most oil.	End.
	Distillation.		Distillation.				
1 Commercial,	15·40	18·39	·863	·860	156°C.	164°C.	168°C.
2 "	22·51	23·80	·850	·851	158	161	167
3 "	2·60	3·90	·856	·853	156	160	166
4 "	14·45	15·10	·864	·860	158	161	168
5 "	36·64	38·62	·873	·868	158	160	170
6 "	21·82	22·55	·860	·858	155	161	165
7 "	16·42	17·40	·856	·852	159	162	170
8 "	25·52	26·40	·860	·858	158	161	168
9 From manufacturer, May, 1889,	9·45	10·50	·876	·873	156	161	165
10 From manufacturer, June, 1889,	3·85	3·90	·870	·868	157	161	166
11 From manufacturer, September, 1889,	16·20	16·80	·867	·865	157	161	167
12 Own distillation from oleoresin,	11·80	—	·869	—	—	—	—

According to Allen (Organic Analysis, ii, p. 439), the following test is of value in the detection of petroleum: Three volumes of turpentine oil with one volume of castor oil will produce a homogeneous mixture, while with petroleum the liquid separates into two layers nearly equal in volume. On trying a mixture made of

different proportions of petroleum (sp. gr. at 15° C., 0·786; boiling point between 150° C. and 160° C.; known as head light oil), it was found that as much as 65 per cent. of petroleum could be mixed without detecting it by the above test.

Absolute glacial acetic acid, 99·5 to 100 per cent. was tried and found to mix in all proportions with petroleum as well as with turpentine oil.

A mixture of 99 cc. absolute glacial acetic acid with 1 cc. of water when mixed with turpentine oil in the proportion of one to one formed a clear mixture, but with petroleum in the same proportions it would not mix. Mixtures of petroleum and turpentine oil in different proportions were found to require different amounts of the above acid for making a clear solution, as follows:

Petroleum, ...	1	2	3	4	5	7	8 cc.
Turpentine oil, . . .	9	8	7	6	5	3	2 cc.
Glacial acid, ...	40	60	80	110	150	230	270 cc.

The crude "gum" was found to be dissolved by absolute alcohol, ether, glacial acetic acid, slightly by 70 per cent. alcohol, and not at all by water.

On treating 100 grams of the original "gum" with petroleum ether boiling between 25° and 45° C. there was dissolved 81 per cent. of it; and by setting the solution aside, clear stellate crystals commenced to deposit in less than a week, and in two or three months about 20 to 25 per cent. of the solution had crystallized in the same form. The 19 per cent. of insoluble matter was treated with stronger ether which dissolved it completely; the solution was set aside and crystals deposited on the bottom and sides of the beaker after long standing; as in the previous solution none formed at the surface.

Another 100 grams of the original "gum" were treated with petroleum ether boiling between 45 and 75° C., which dissolved 97 per cent.; the solution was filtered and on standing, gradually deposited crystals in the same manner and similar in appearance to those from light petroleum ether.

The 3 per cent of the "gum" which was insoluble was dissolved in stronger ether, and upon spontaneous evaporation of the ether a resinous mass was left.

The crystals that were gotten from the different petroleum ethers

were purified by repeated recrystallization from stronger ether and submitted to ultimate analysis.

Two combustions of those from the light petroleum ether were made with the following results:

	I. Per Cent.	II. Per Cent.	Composition of Abietic Acid. Per Cent.
C,	78·37	78·50	78·57
H,	9·65	9·50	9·52
O,	11·98	12·00	11·91
	100·00	100·00	100·00

Melting point, ... 131° C.
Melting point of abietic acid given by Flückiger, ... 135° C.
Melting point of abietic acid given by Dragendorff, soften at 129° C., melts at . . . . . 144° C.

Crystals from heavy petroleum ether:

	I. Per Cent.	II. Per Cent.
C,	72·00	72·80
H,	9·75	9·50
O,	18·25	17·70
	100·00	100·00

Melting point, ... 125 to 126° C.

The crystals obtained from the heavier petroleum ether were purified by recrystallization from ether, and combustions were made at different periods in their purification without finding any change from the above composition. It is likely that several crystallizable resins are present in the crude "gum." They are worthy of much further investigation which could not be completed in the time at my disposal for this work.

QUANTITATIVE ESTIMATION OF COD LIVER OIL IN THE MALT EXTRACT WITH COD LIVER OIL PREPARATIONS.

By. J. B. Nagelvoort.

Professor J. König refers in his admirable compilation "Chemische Zusammensetzung der menschlichen Nahrungs- und Genussmittel," 3te Aufl., 1889, to 17 kinds of malt extracts. A few analyses are old and none is American. But I have no doubt that their figures

serve yet. The editor of the *Pharm. Rundschau* filled last year (*Rundschau*, 1889, p. 218) to some extent another deficiency in this branch of analytical work and quoted many analyses of infant food, lactated food, milk food and farinaceous food.

But I cannot find reports on assays of malt extracts containing cod liver oil, and offer a few of mine, considering their place to be among food analyses. I will describe first the simple method followed:

A—25 grm. of the preparation containing malt extract with cod liver oil is boiled in a suitable flask with 10 times its volume of water for an hour.

B—Remove, yet warm, to a large separator and set aside in a warm place for 24 hours; the wash waters of the flask are, of course, added to the contents of the separator.

C—The watery fluid is separated from the frothy top layer. This layer is shaken out with a large quantity (500 cc.) of boiling water and the separator again set aside in a warm place for 24 hours. This operation is repeated until the watery fluid separates clear, which takes usually 3 or 4 days, and depends for a good deal on a sharp separation.

D—After the removal of the water, I add 100 cc. of a mixture of equal quantities of ether and chloroform (this is preferable to chloroform alone, which emulsifies too easily, neither did amyl-alcohol yield good results). Agitate thoroughly, separate, collect in a tared porcelain dish, expel ether and chloroform, cool off and weigh; multiply results by 4 to obtain the percentage of the oil.

E—The oil is to be examined in regard to iodine absorption, to free and combined fatty acids, specific gravity, iodine, albumen, etc., just as a natural product, this I *consider to be as important as any assay of a crude drug.* (Compare on Standard Sperm Oil in *Druggists' Circular*.)

I determined lately the cod liver oil in a few samples malt extract with cod liver oil of American manufacture and made an emulsion myself to test the value of the process given above:

No.	Percentage of Oil claimed.	found.	Spec. Grav.
1,	40	35	—
2,	40	26	—
3,	12·5	7·5	1·32
4 (own made),	12·5	12	1·27

The difference between the percentage figures in the two columns are probably the consequence of an unintentionally inaccurate description. I think Nos. 1, 2 and 3 are erroneously reckoned by volume.

How misleading those statements are may be seen from a specific gravity determination. Cod liver oil is usually 0·923; malt extract is more variable, 1·36 is found to be an average.

My own emulsion of malt extract with cod liver oil (No. 4) had the specific gravity 1·27, and the malt extract used was 1·35. The oil contained ± 1 per cent. free fatty acids, and the malt extract had a converting power for starch (potato starch) of 1 : 10, items which I recommend for consideration when there is question of malt extract with cod liver oil *as a food.*

LABORATORY OF PARKE, DAVIS & CO.,
DETROIT, May 14, 1890.

GLEANINGS FROM THE GERMAN JOURNALS.

BY FRANK X. MOERK, Ph.G.

Cold Cream is recommended by Maercker to be made from arachis oil instead of almond oil. 4 parts white wax, 5 parts cetaceum and 28 parts arachis oil are melted on a water bath, and to the partially cooled mixture are added 4 parts more of arachis oil with constant stirring, finally incorporating 16 parts rose water, in which $\frac{1}{6}$ part borax is dissolved. To every 50 grams of the cold ointment one drop oil of rose is added.—*Pharm. Ztg.*, 1890, 121.

Creasote-glycerin.—Ten parts creasote, 20 parts alcohol, 10 parts magnesium carbonate, 40 parts glycerin and 40 parts water are rubbed together, the mixture agitated repeatedly during several days and filtered. From this preparation *Vinum Creasoti* is made by mixing creasote-glycerin 30, water 30, syrup 20, and white wine 40; *Syrupus Creasoti* by taking creasote-glycerin 20 and syrup 140; and *Aqua Creasoti* by mixing creasote-glycerin 10 and distilled water 300.—Bretter (Hygea), *Oesterr. Ztschr. f. Pharm.*, 1890, 138.

Test paper for the detection of chlorides.—A solution of potassium chromate is precipitated by silver nitrate and the silver chromate redissolved by adding a few drops of ammonia. Bibulous paper is saturated with this solution and, while still moist, drawn through a very dilute nitric acid; the dilute acid causes the precipitation of

silver chromate upon the fibres and a paper of uniform red color results. If such paper be immersed in a solution containing chlorides, the red silver chromate is converted into white silver chloride and the paper becomes colorless; 3 parts of a chloride in 10,000 parts solution can be recognized. The reagent, because of its simplicity, is advanced for industrial and household purposes.—Hoogvliet, *Pharm. Weekblad*; *Apoth. Ztg.*, 1890, 165.

Pyrrol is recommended by Prof. A. Ihl as a delicate reagent for a class of essential oils which contain derivatives of allyl-benzol, as cinnamic aldehyde, eugenol, safrol and anethol. The most delicate reaction was obtained with *oil of cinnamon*. A very dilute alcoholic solution of this oil, to which a small quantity of an alcoholic pyrrol solution and then a little concentrated hydrochloric acid is added, produces first a yellowish red color, changing rapidly to dark red and finally produces a dark precipitate. Traces of cinnamon oil and of pyrrol can be identified by this test. *Oils of cloves and pimenta* in alcoholic solution, as above, give rise to beautiful carmine colorations. *Oil of sassafras* forms a beautiful rose-red coloration. The *oils of fennel, anise* and *star-anise* give only faint reactions.—*Chemiker Ztg.*, 1890, 438.

Ethyl bromide, made by the following directions, is obtained free from ether, which is so difficult to remove. To a cold mixture of 12 parts sulphuric acid and 7 parts alcohol of specific gravity 0·816 are added slowly 12 parts powdered potassium bromide and the mixture distilled from a sand-bath. The distillate is repeatedly agitated with fresh portions of water, as long as this removes anything; then the ethyl bromide is agitated with strong sulphuric acid, allowed to stand for 12 hours, removed from the acid and shaken up with 10 per cent. solution of potassium carbonate, separated, dried by use of fused calcium chloride and distilled at a temperature of 38° C. from a water bath. Ninety-nine parts of the distillate are mixed with 1 part absolute alcohol for preservation. The preparation has a sp. gr. 1·455 to 1·459 and boils at 38 to 40° C.—Dr. C. Brunnengräber, *Apoth. Ztg.*, 1890, 130.

Cantharidin.—Of various solvents, E. Dieterich finds acetone to be the best for this substance, requiring only 38 parts at 15° C. to dissolve 1 part cantharidin; of chloroform, 65 parts are necessary; of ether, 550 parts. To make

Oleum Cantharidini.—One part finely powdered cantharidin is

dissolved by cautious heating in 40 parts acetone and then 960 parts rape oil, or better olive oil, are added. The acetone prevents the crystallization of the cantharidin.

Collodium Cantharidini.—One part finely powdered cantharidin is rubbed up with 40 parts castor oil and dissolved with the aid of heat; after cooling, 40 parts acetone and 900 parts collodium are added, and then colored by addition of 10 parts tincture of cannabis.—(Helfenberger Ann.) *Pharm. Centralhalle*, 1890, 264, and *Apotheker Ztg.*, 1890, 193.

Lanolin in powder form.—The lanolin is dissolved in ether, alcohol, chloroform or acetone, the solution mixed with magnesia and the mass dried; the powder is then mixed with starch in any desirable proportion. Instead of starch, zinc oxide, bismuth salts, barytes or talc may be used. The powder is claimed to be valuable in skin diseases, especially for chapped surfaces.—(*Il farm. ital.*) *Oesterr. Ztsch. f. Pharm*, 1890, 214.

Lanolin-Cream.—Lanolin is mixed with twenty times its weight of distilled water and warmed to 65° C.; for every 5 gms. lanolin 0·25 gm. absolutely neutral soap are incorporated. If desired, a minimal quantity of borax, dissolved in water, may be added to the preparation.—Jaffe & Darmstädter (*Pharm. Ztg.*) *Pharm. Centralhalle*, 1890, 236.

Insect Powder.—The value of insect powder is generally supposed to be due to some volatile constituent; it is therefore frequently put up in well-closed containers, and considerable stress laid upon its having a decided odor, if effective. E. Hirschsohn, examining a sample of the powder which for five years had been kept in a paper box, found it to be entirely odorless, but as effective as when purchased. A number of fresh samples of Persian and Dalmatian powders, which were tested and found to be effective, were heated to 120° C. for eight hours, but had not lost their activity, although they were completely deprived of odorous principles. Thinking that the value depended upon the presence of acid resin and this gradually becoming neutralized by absorption of ammonia from the atmosphere might cause deterioration, experiments were made in which the powder was mixed with alcoholic ammonia to alkaline reaction and allowed to dry at ordinary temperature; when dried, the powder showed the original activity

neither being increased nor decreased. Of various solvents, water gave an inert extract upon evaporation; 95 per cent. alcohol, 70 per cent. alcohol, chloroform, ether, benzol, carbon disulphide and petroleum ether all extracted the active constituent, and the residual powder was inert. With the exception of the carbon disulphide extract, which was neutral, the extracts were acid to litmus paper. If the active extractions be mixed with some inert powder, like powdered chamomile, the product acts like the original powder. Seventy per cent. alcohol will remove from the petroleum-ether extract an oily resinous mass, which, placed upon the tongue, produces a sensation similar to an extract obtained from the pyrethrum root; these substances must be different, however, as pyrethrum possesses no vermin-destroying properties.—*Pharm. Ztschr. f. Russl.* 1890, 209.

Detection of thiosulphate in bicarbonate of sodium: 5 gm. bicarbonate of sodium and 0·1 gm. calomel are triturated with 2 drops of distilled water when, if the impurity is present, the mixture will be colored gray, due to formation of mercuric sulphide.—F. Musset, *Pharm. Centralhalle*, 1890, 230.

Iodine may be purified as follows: A convenient quantity of iodine is placed in a beaker and covered with a concentrated solution of iodide of potassium, the beaker covered with a watch crystal and heat applied until the iodine melts; the melting point of iodine is below the boiling point of the iodide of potassium solution and, hence, the operation proceeds nicely. After the beaker and contents become cool the iodine-cake is removed, broken up and after draining in a funnel, washed with water. The product is free from chlorine and is easier obtained in this condition than by resublimation; the mother liquor is reserved for future operations.—F. Musset, *Pharm. Centralhalle*, 1890, 230

Cassia oil may be tested for likely adulterations by the following simple tests: (1) Agitation of the suspected sample with three volumes of petroleum ether sp. gr. 0·650 should neither produce an increase nor decrease of the volume of oil taken; a decrease in volume would indicate the presence of other essential oils, fixed oils, resin or kerosin; an increase, the presence of larger quantities of castor oil. (2) The clear petroleum-ether layer of the above test agitated for several minutes with copper hydrate (obtained by precipitating copper sulphate solution with solution of potassium

hydrate, washing and drying at ordinary temperature) should give no blue or green filtrate; absence of colophony or copaiva (3) One volume of the oil with three volumes of 70 per cent. alcohol at 15° C. should give a clear or only opalescent solution; should a turbidity or separation take place, the presence of petroleum, fixed oils, other volatile oils or larger quantities of colophony would be indicated. (4) The above 70 per cent. alcoholic solution mixed drop by drop with ½ volume of an alcoholic solution of lead acetate (70 per cent. alcohol saturated at ordinary temperature with lead acetate) should produce no precipitate; absence of colophony or similar resins. —E. Hirschsohn, *Pharm. Ztschr. f. Russl.*, 1890, 225 and 241.

Jalap resin.—Prof. Flückiger accounts for the noticed decreased yield of jalap resin in the last twenty years by the partial extraction of the resin by means of alcohol before the jalap is placed upon the market (Am. Journ. Pharm., 1890, 141). Bellingrodt has observed no diminution in the yield of jalap resin; he publishes results of assays made in 1851–1854 with an average yield of 11·58 per cent. and the average for the last thirty years he gives as 11·60 per cent. E. Dieterich finds the yield for the last two years to have been 7·1, 7·7, 6·6 and 8·1 per cent. confirming Flückiger's statement. These last figures have reference to officinal resin and not to total extract soluble in alcohol; in the last lot examined by him the total amount soluble in alcohol was 14 per cent., while the officinal resin was only 8·1 per cent. (*Helfenberger Ann.*) *Chem. Ztg. Rpt.*, 1890, 116.

Pyoktanin, a new antiseptic introduced by E. Merck, is one of the aniline dyes which for a long time have been known to destroy bacteria and bacillus of all kinds. The violet aniline dyes in solutions 1 : 30,000 retard the growth of bacteria and in 1 : 2,000 to 1 : 1,000 prevent putrefaction. Two dyes are at present put upon the market, a *blue* one, Pyoktanin cæruleum and a *yellow* one Pyoktanin aureum, the former used for surgical, the latter for ophthalmic purposes. Of each can be obtained, dusting powders 1 and 2 per cent., ointments, pencils, pastilles for making solutions, and dressings 1 per cent. The experiments leading to the discovery of the value of these preparations were made by Prof. Stilling of Strassburg.—*Pharm. Ztg.*, 1890, 261.

Penghawar Djambi is revived as a hemostatic by Noltenius (*Provinc. Med. Jour.*). It is used mixed with cotton, in tampons. It is very elastic.

CHEMICAL NOTES.

By Henry C. C. Maisch, Ph.G., Ph.D.

Test for purity of quinine sulphate.—E. Hirschsohn (*Pharm. Zeitschr. f. Russland*, 1890, xx, p. 1) gives the following method for determining whether sulphate of quinine is chemically pure: 0·2 gm. of the salt is well shaken with 5 cc. of a mixture of 30 pts. by volume of petroleum ether (sp. gr. 0·680) and 70 pts. of chloroform and filtered immediately. To the perfectly clear filtrate three volumes of petroleum ether are added. Pure quinine sulphate yields a clear solution while all other cinchona alkaloids show opalescence or give precipitates. According to the author, 0·1 per cent. of the accompanying alkaloids can still be detected by this method.

On Tiliacin.—P. A. Latschinow (8th Congress of Scient. and Physic. in St. Petersburg; through *Chem. Zeit.*, 1890, p. 126) found in the linden (Tilia) leaves a glucoside, tiliacin, which can be split into glucose and *tiliaretin*. The latter is decomposed further into *anisic acid* and other bodies not further studied. The leaves of *Cirsium arvense* seem to contain also tiliacin while the glucoside of *Phlox paniculata* differs as well from tiliacin as from hesperidin.

Ethereal oil of Daucus Carota.—Schimmel & Co. prepare this oil by treating the fruit with high pressure steam. According to M. Landsberg (*Arch. Pharm.*, 1890, ccxxviii, 85) the oil is yellow, of a pleasant carrot odor and pungent taste, is acid to litmus paper and easily soluble in alcohol, ether, glacial acetic acid, chloroform, etc. Sp. gr. at 20° C. 0·8829. The chemical constituents are (1) a terpene boiling at 159–161° C., and belonging to the pinene group (Wallach), and (2) an oxygenated portion $C_{10}H_{18}O$ closely allied to cineol and can be regarded as a monohydrated terpene. Acetic acid was noticed in small quantity.

Ethereal oil of Massoy bark.—Schimmel & Co. put on the market an oil under the above name, which is obtained from a lauraceous plant of New Guinea. The oil is limpid, perfectly clear, yellow and resembles cloves in odor. According to E. F. R. Way (*Arch. Pharm.*, 1890, ccxxviii, p. 22) the composition is as follows: (1) a terpene $C_{10}H_{16}$, named *massoyene* which does not correspond to any hydrocarbon described by Wallach; (2) *safrol*, by oxidation with $KMnO_4$ the odor of piperonal was distinctly noticed; (3) *eugenol* of the formula $C_6H_3(CH_2CH=CH_2)OCH_3, OH$; (4) a small quantity of creasote-like bodies.

On Taxine. — A. Hilger and Fr. Brande (*Ber. d. Deutsch. Chem. Gesell.* 1890, 464), after reviewing the literature on the examination of *Taxus baccata*, describe their work on the ethereal extract from which they isolated the alkaloid by the process of Marmé (Medicin. Centralb. xiv, 97). Leaves and fruits were extracted several times with ether, the latter recovered, the residue treated a few times with acidulated water and the alkaloid precipitated with ammonia. The powder was dried in a desiccator over sulphuric acid. It is easily soluble in alcohol and ether, but could not be obtained in a crystalline state. Concentrated sulphuric acid gives a red color, while hydrochloric, nitric and phosphoric acids give none. The most of the alkaloidal reagents yield amorphous precipitates, platinum and gold chlorides give no precipitates; with Froehde's reagent a red violet color was obtained. The salts prepared are the following: acetate, oxalate, tartrate, chloride, sulphate and the platinum and gold double salts. The formula of the alkaloid is $C_{37}H_{52}O_{10}N$.

Chemical characterization of the constituents of Cetraria islandica. —A. Hilger and O. Buchner (*Ber. d. Deutsch. Chem. Gesell.* 1890, p. 461) use the following methods for isolating *lichenstearic* and *cetraric acids.* The lichen, reduced to a coarse powder, is completely extracted with petroleum ether and this recovered. The dried residue is stirred into boiling water, and to the boiling mixture sodium bicarbonate added in small quantities, so that a part of the residue remains undissolved. The solution, while hot, is filtered and supersaturated with hydrochloric acid. The precipitate is pressed between bibulous paper and recrystallized from petroleum ether, using animal charcoal for decolorizing. Further purification is accomplished by crystallizing from boiling alcohol. The acid is a white voluminous mass, consisting partly of small prisms, which, however, soon fall into glossy leaflets, melts at 120° C., soluble in alcohol, chloroform, ether, benzol, petroleum ether and nearly insoluble in water. By combustion and analysis of the silver, barium and lead salts and of the chloride the composition $C_{43}H_{76}O_{13}$ was determined for lichenstearic acid. Cetraric acid was obtained by Knop and Schnedemann's method (*Lieb. Ann.* lv, 150), by boiling Iceland moss for quarter of an hour with alcohol and potassium carbonate, precipitating with hydrochloric acid, extracting with petroleum ether and treating the residue to remove coloring matter with

equal volumes of ether and turpentine. The acid was not obtained in a crystalline form, but as a white, bitter powder, barely soluble in water, soluble in alcohol and difficultly soluble in ether and petroleum ether. The melting point could not be obtained, as the acid decomposes below 200° C. A combustion and analysis of silver and barium salts give the formula $C_{30}H_{30}O_{12}$, and, like the above acid, show it to be dibasic.

The use and change of alkaloids in some seeds during germination.—Edouard Heckel (*Compt. rend.*, 1890, cx, 88) has examined the behavior of strychnine, brucine, daturine and coffeine during germination. For *coffeine* the seeds of *Sterculia acuminata* were used. The fresh seeds contained in 100 gm. 2·37 gm. coffeine; after one year the cotyledons contained only 1·072 gm., after two years, 0·70 gm. and after three years 0·21 gm. During the time the alkaloid disappeared chlorophyl and potassium nitrate, which are never present in the recent seeds, made their appearance. For the alkaloids of the pyridine series *Strychnos Nux vomica* and *Datura Stramonium* were used. In a relatively short time (2–5 months depending on the size of the seeds) all the alkaloids in the endosperm had been converted into more assimilable compounds. That this change is produced by the embryo was shown by removing the same and placing the seeds in moist earth when the endosperm retained its entire amount of alkaloids. In *Physostigma venenosum* the eserine disappears in the cotyledons during germination, and the new compounds are transported into the young plant. Eserine disappears also when the embryo is removed and the seed is then planted. From his experiments the author draws the conclusion that the alkaloids act as reserve material for the nourishment of the young plant and must undergo a change in chemical constitution to become assimilable.

ABSTRACTS FROM THE FRENCH JOURNALS.

Translated for the American Journal of Pharmacy.

Danger in Crystallized Aconitine.—The *Journal de Pharmacie d' Anvers* for February reports a case of death after ingesting two pills of a quarter of a milligramme each, of crystallized aconitine. They were prescribed by a physician. It is now two years since the *Société de Pharmacie de Paris* recommended that pills of this substance should not contain more than one-tenth of a milligramme

of this substance. A list was at that time read, of several deaths having occurred after taking a single granule, one-quarter of a milligramme of the crystallized principle.

Emulsion of Salol.—M. Jouisse proposes the following: Salol, 4 gm.; gum arabic, 4 gm.; gum tragacanth, 20 cgm.; tincture of tolu, 10 gm.; simple syrup, or syrup of tolu, 30 gm.; distilled water, q. s.; the simple syrup may be replaced by aromatic syrups. The tincture of tolu should be first mixed with the water and, after partial precipitation, passed through a cloth filter. M. Jouisse adds sufficient water to give 50 cgm. of salol to a tablespoonful. Four to six tablespoonfuls of the emulsion may be given daily, and the number gradually increased to eight. The author thinks that in cancer and ulceration of the stomach, the use of this emulsion will make the use of Faucher's tube and "washing-out solutions" unnecessary.—*Nouv. Rem.*, April 8.

Laborde's Antiseptic Solution.—This is composed of: Bichloride of mercury, 25 cgm.; chloride of sodium, 1 gm.; sulphate of copper, 1 gm.; tartaric acid, 50 cgm.; "soluble blue," 1 cgm.; distilled water, 10 gm.; glycerin, 10 gm.; in using, add 1 litre of water. This was proposed as a substitute for Budin's "Antiseptic powders for midwives" (See American Journal of Pharmacy, 1890, p. 180), on the ground that it was a safer preparation than Budin's and of equal antiseptic power. The sulphate of copper contained in it would act, said M. Laborde, as an emetic. But the Academy of Medicine finally adopted Budin's powder.—*Répert. de Phar.*, March 10.

Permanganate of Potassium Pills.—Several Parisian pharmacists have experimented of late in the preparation of these pills, but for the most part they have met with indifferent success. M. Vincens, however (*Nouv. Rem.*, Apr. 8), claims to have succeeded. His formula is as follows: Permanganate of potassium, 1 gm.; pure clay, 5 gm.; distilled water, 15 to 30 drops. Macerate the clay with q. s. of water to make a soft paste, and incorporate the permanganate of potassium. The pills are homogeneous, smooth, and break up readily in the stomach. They should be dried slightly and rolled in powdered talc. They are not (says the author) attacked by organic matters, and the salt does not decompose. M. Vincens adds that the following—a longer method—gave an equally good result: Silicate of potassium, 2 gm.; distilled water, 1·50 to 2 gm.; powdered

talc, q. s.; permanganate of potassium finely pulverized, 1 gm. The silicate was well mixed with the water and q. s. of talc was added to make a soft paste. In a few moments the mass became of proper consistence for division. The author gave the preference to the former preparation, as the silicate pills were not so readily soluble, and showed slight cracks on their surfaces. [In England Mr. Martindale, in 1884, introduced kaolin combined with soft paraffin as a suitable excipient; the same has been used in this country, also fuller's-earth, pipeclay, resin cerate, simple cerate and others.—*Trans.*]

Simple Apparatus for Making Sulphuretted Hydrogen.—Remove the cork and piston of a glass syringe, fill it to within a third of the large opening with morsels of sulphide of iron of about the size of a pea, and fit to the same orifice, a rubber tube connecting with a glass syphon. To the small opening of the syringe attach a piece of rubber tubing connecting with a glass tube furnished with a stop-cock. The latter being opened, the syringe is placed in a conical glass vessel containing a sufficient quantity of hydrochloric acid to cover the iron salt. The gas commences at once to form. To stop the disengagement of gas close the stop-cock The syringe is then placed in a jar of pure water, and, the cock being again opened, the apparatus becomes filled with water and chloride of iron is dissolved.—*Bull. de la Soc. de Phar.*, Brussels, Feb. 15.

Artificial Malachite.—M. Fouqué lately exhibited at the *Académie des Sciences* a specimen of M. de Schulten's product, obtained by heating for eight days in a water-bath, a solution of carbonate of copper precipitated by one of carbonate of ammonia. As the ammonia volatilizes the carbonate of copper is deposited in a green crystalline mass on the sides of the vessel. This becomes slowly covered with small, green crystals of malachite which have the same chemical composition as the natural mineral.—*Répert. de Phar.*, March 10.

Antifebrin is liable to produce unpleasant symptoms of cerebral excitement and even hallucinations in aged and weak persons. For this reason Dr. Stein advises (*Prag. Medic. Wochens.*, Jan., 1890) to give antifebrin to such patients in doses beginning with 0·05 to 0·10 gm.

Ammonium picrate is of no value as a substitute for quinine, according to Dr. H. M. Clark (*The Lancet*, Feb. 15, 1890), because it does not lower the temperature. It may be given in ague on the febrile days, the dose being six grains in 24 hours, which may be taken without producing unpleasant symptoms.

DIRECT PRODUCTION OF SODIUM CARBONATE AND CHLORINE FROM SODIUM CHLORIDE.[1]

By W. Hempel.

In the electrolysis of metallic chlorides, which give readily soluble decomposition-products, the latter are further decomposed as soon as the quantity produced reaches a certain limit. When, however, the compound produced is only sparingly soluble, this secondary decomposition does not take place, and the whole strength of the current is utilized. Potassium chloride and sodium chloride, for example, can be converted into the corresponding chlorate; calcium chloride and magnesium chloride can be decomposed into chlorine and a solid hydroxide, by employing a diaphragm.

Marx has shown that alkaline chlorides can be directly converted into chlorine and an alkaline hydrogen carbonate, by passing carbonic anhydride through the solution during electrolysis, metal and liquid diaphragms being employed.

The author, who has been engaged independently in making similar experiments, describes, with the aid of diagrams, an apparatus in which sodium chloride can be directly converted into chlorine and crystalline carbonate. The cathode is a perforated iron disc, the anode a perforated carbon disc, the perforations being about 4 mm. in diameter, and bored in an upward direction to allow the gas to escape freely. A disc of ordinary asbestos-paper, placed immediately between the carbon and iron discs, serves as a diaphragm. The three discs are placed in the centre of a vessel made of porcelain and glass, which is thus divided into two chambers, each of which is provided with a conducting tube, in one case for carbonic anhydride, in the other for chlorine. If sodium chloride is added from time to time through a suitable aperture, and the water which is removed with the crystalline carbonate is replaced, the apparatus can be worked continuously, sodium carbonate and almost chemically pure chlorine being obtained.

A tension of 3·2 volts is required for decomposing the sodium chloride, and a tension of 2·5 volts to overcome the polarization current; but the latter has only a slight tension when both electrodes

[1] *Berichte* XXII, 2475–2478. Reprinted from *Jour. Chem. Society*, January, 1890, p. 10.

are made of carbon. With a current of 1·73 ampères 0·93 gram of chlorine per hour was produced, so that if a dynamo were employed it should give 64·5 grams of chlorine and 259·8 grams of Na_2CO_3 + 10 H_2O per horse-power-hour.

BASES CONTAINED IN THE YOUNG SHOOTS OF SOLANUM TUBEROSUM.[1]

By R. Firbas.

The two products, the one crystalline and the other amorphous, obtained in the preparation of solanine from the young shoots of the potato, are now shown contrary to earlier views, not to be chemically identical. The author names the crystalline compound *solanine*. It has the formula $C_{52}H_{93}NO_{18}$, $4\frac{1}{2}H_2O$, and when dried at 100° appears to be anhydrous, or to contain only half a molecule of water of crystallization. From a solution in 85 per cent. alcohol, it crystallizes in colorless needles, which melt at 244°, are almost insoluble in ether and alcohol, and are readily dissolved by dilute hydrochloric acid. *Solanidine hydrochloride*, $3(C_{40}H_{61}NO_2,HCl)$ HCl + H_2O or $1\frac{1}{2}H_2O$, is obtained by boiling solanine with a 2 per cent. solution of hydrochloric acid. It is a slightly yellow powder which is only very sparingly soluble in water, and carbonizes without melting when heated to 287°. Simultaneously with solanidine hydrochloride a sugar is formed in accordance with the equation $C_{52}H_{93}NO_{18} = C_{40}H_{61}NO_2 + 2C_6H_{12}O_6 + 4H_2O$.

The amorphous substance obtained simultaneously with solanine, and which the author names *solanëine*, has, when dried at 100°, the formula $C_{53}H_{87}NO_{13}$, or $C_{52}H_{83}NO_{13}$. The loss of weight on heating the air-dried compound at 100° corresponds with the formula $C_{52}H_{83}NO_{13}$ + $3\frac{3}{4}$ or $4H_2O$. It is a yellow, horny, perfectly amorphous substance, melting at 208°, is more soluble in an 85 per cent, solution of alcohol than is solanine, and on treatment with hydrochloric acid yields solanidine and a sugar in accordance with the equation $C_{52}H_{83}NO_{13} + H_2O = C_{40}H_{61}NO_2 + 2C_6H_{12}O_6$.

The sugar obtained by the hydrolysis of solanine and solanëine forms a yellow, amorphous mass with a caramel-like odor, dissolves readily in water and wood-spirit, and has a specific rotatory power of $[\alpha]_D = +28·623$. With phenylhydrazine hydrochloride and sodium

[1] *Monatshefte*, X, 541–560. Reprinted from *Jour. Chem. Soc.*, 1890, p. 75.

acetate in aqueous solution, it forms a glucosazone melting at 199°, and resembling the compounds obtained similarly from dextrose, levulose, and several other sugars. With nitric acid it gives no recognizable trace of mucic or saccharic acids. The general behavior of the sugar points to the conclusion that it is some other sugar than dextrose, or a mixture of sugars.

Solanidine has the formula $C_{40}H_{61}NO_2$ or $C_{41}H_{65}NO_2$, and is obtained from alcoholic solution in amorphous masses interspersed with needles melting at 191°. It dissolves readily in hot alcohol, with difficulty in ether, and on treatment with excess of dilute sulphuric acid forms a sulphate, $3(C_{40}H_{61}NO_2,H_2SO_4),H_2SO_4 + 8H_2O$; this crystallizes in scaly plates melting at 247°, and is readily soluble in water. Its diacetyl-derivative, $C_{40}H_{59}O_2NAc_2$, crystallizes in needles melting at 203°.

CONVENTION FOR THE REVISION OF THE PHARMACOPŒIA OF THE UNITED STATES.

The Convention met in the Law Lecture Hall of the Columbian University, May 7, and at noon was called to order by the President of the Convention of 1880, R. Amory, M.D. A Committee on Credentials was appointed, consisting of three each representatives of the medical and pharmaceutical delegates, and of one representative of the Government services. While the Committee was engaged in examining the credentials, the Convention took a recess until 2.30 P. M., and in the interval the members paid their respects to the President of the United States.

After reassembling, the Convention received and adopted the report of the Committee, according to which delegates had been accredited by the American Pharmaceutical Association, the three medical departments of the U. S. service, and about 48 medical and 56 pharmaceutical colleges and incorporated societies entitled to representation under the rules adopted in 1880. Several other organizations had sent credentials not accompanied by proper vouchers. These were disposed of by admitting the delegates after verbal proof had been received that these bodies were duly incorporated. Among the delegates present were several ladies. A number of gentlemen interested in pharmacopœial work, who were present, though not as delegates, were accorded the privileges of the floor. A committee was then appointed, consisting of one member from each delegation, charged with the nomination of officers of the Convention, and of the members of the Committee of Revision and Publication.

At the second session, held Thursday morning, the Nominating Committee reported the following:

For Officers of the Convention:

For President, Horatio C. Wood, M.D., Philadelphia (Philadelphia County Medical Society).

For Vice-Presidents, W. S. Thompson, Washington, D. C. (National College

of Pharmacy); D. W. Prentiss, M.D., Washington (National Medical College); J. M. Flint, Washington (U. S. Navy); A. E. Ebert, Ph.G., Chicago (American Pharmaceutical Association), and Prof. W. M. Searby, San Francisco (California College of Pharmacy).

For Secretary, Hobart A. Hare, M.D., Philadelphia (University of Pennsylvania).

For Assistant Secretary, G. H. C. Klie, St. Louis (Missouri Pharmaceutical Association).

For Committee of Revision and Publication:

Prof. Roberts Bartholow, M.D., Philadelphia (Jefferson Medical College).
Prof. P. W. Bedford, Ph.G., New York (New York College of Pharmacy).
F. A. Castle, M.D., New York (New York Academy of Medicine).
Prof. C. A. Curtman, M.D., St. Louis (Missouri Medical College).
N. S. Davis, Jr., M.D., Chicago.
Prof. C. L. Diehl, Ph.M., Louisville (Louisv. Coll. Phar. and Ky. Phar. Assoc.).
R. G. Eccles, M. D., Brooklyn (N. Y. State Pharmac. Assoc.).
R. T. Edes, M.D., Washington, D.C. (Medical Society of the Dist. of Columbia).
J. M. Flint, M.D., Washington, D. C. (U. S. Navy).
John Godfrey, M.D., Washington, D. C. (U. S. Marine Hospital Service).
Prof. W. R. Gregory, M.D., Buffalo (Buffalo College of Pharmacy).
C. S. N. Hallberg, Ph.G., Chicago (Chicago College of Pharmacy).
Prof. J. M. Maisch, Phar.D., Philadelphia (Phila. College of Pharmacy).
Prof. G. F. H. Markoe, Ph.G., Boston (Massachusetts Pharmac. Assoc.).
W. M. Mew, M.D., Washington, D. C. (U. S. Army).
Chas. Mohr, Ph.D., Mobile, Ala. (Alabama Pharmaceutical Association).
Prof. O. Oldberg, Phar.D., Chicago (Illinois College of Pharmacy).
Prof. F. B. Power, Ph.D., Madison, Wis. (University of Wisconsin School of Pharmacy).
Prof. J. P. Remington, Ph.M., Philadelphia (Phila. Coll. of Pharmacy).
Chas. Rice, Ph.D., New York (New York College of Pharmacy).
Prof. H. H. Rusby, M.D., Newark, N. J. (New York Coll. of Pharmacy).
Prof. L. E. Sayre, Ph.G., Lawrence, Kan. (Kansas Pharmac. Assoc.).
Alfred B. Taylor, Ph.M., Philadelphia (American Pharmac. Assoc.).
Prof. O. A. Wall, Ph.G., M.D., St. Louis (St. Louis College of Pharmacy).
Thos. F. Wood, M.D., Wilmington, N. C. (North Carolina Medical Society)

All these nominations were approved by the Convention, and subsequently the President was added to the Committee of Revision as a member *ex officio*.

The Secretary of the Committee of Revision of 1880, Prof. Bedford, read a report giving a résumé of the work done by that Committee during the past ten years. Mr. Doliber, Treasurer of the same Committee, presented his report showing that the income of the Committee had been from the sale of about 17,000 copies of the Pharmacopœia $6,797, and from interest $521.17, making a total of $7,317.17; the expenses amounted to $4,438.67, leaving a balance on hand amounting to $2,878.50.

The reports were accepted, and the balance on hand was directed to be paid over to the present committee.

The Convention then proceeded to the consideration of the draft submitted

by the retiring Committee, of the general principles which are to guide the Committee in their work of revision, and which was finally adopted as follows:

(1) *General Directions.*—The Committee of Revision, etc., is directed to follow the general principles adopted by the Convention in 1880, so far as the same are not modified or superseded by special directions in the succeeding paragraphs.

(2) *Assay Processes for Drugs.*—It is recommended that assay processes be appended to the descriptions of the more energetic or otherwise important drugs containing active principles, provided the therapeutic value of the drug depends upon the amount of these principles, and provided, also, that these principles can be assayed and identified with reasonable accuracy and without requiring complicated processes. The Committee may attach a note stating the *usual* percentage of these active principles in good commercial samples of the drug, and, if it be found feasible, it may attach a requirement that the drug shall not be used unless it conforms to these limits.

(3) *Assay Processes for Galenical Preparations.*—The Committee may attach assay processes to such galenical preparations as fluid extracts, tinctures, etc., but it shall omit requirements of a definitive strength or percentage of active principles except in the case of drugs for which an upper or lower limit, or both, of active principles is prescribed.

(4) *Assay Processes for Opium and Cinchona.*—In the case of opium and cinchona the Committee shall adopt such processes of assay as will be found to yield the largest proportion of the desired active principles with greatest uniformity and with least manipulative difficulty, the object of these processes being to ascertain how much of the respective principles can practically be extracted.

(5) *Description of Chemicals and Tests.*—In the case of chemicals, the degree of purity, or the allowable percentage of impurity, shall be prescribed as closely as practicable. The standard of purity shall be set as high as practicable for legal enforcement, but not beyond a point reasonably attainable by the manufacturer without subjecting any particular product to unnecessary cost through the enforced removal of some harmless and insignificant accidental impurity.

(6) *Chemical Formulas.*—Chemical formulas shall be given only in the new notation.

(7) *Proprietary or Patented Articles.*—No substance which cannot be produced otherwise than under patented processes, or which is protected by proprietary rights, shall be introduced into the Pharmacopœia.

(8) *Nomenclature.*—In the choice of titles of official articles it is recommended that convenience, established custom, and considerations of safety against mistakes, through similarity of or changes in names, should outweigh purely theoretical considerations or scientific preciseness.

(9) *Specific Gravity.*—It is recommended that the Committee define the exact degree of temperature of the standard by which other specific gravities are to be determined, and the specific gravities of the various officinal liquids shall be determined and stated by the Committee, so far as it may be practicable, on the basis of the established temperature and other conditions of the standard.

(10) *Weights and Measures.*—It is recommended that the next Committee of Revision be instructed to direct solids to be weighed and liquids to be measured, *except in such cases as the Committee may find advisable, and that the metric system be employed for that purpose.*

(11) *General Formulas.*—It is recommended that general formulas be introduced for fluid extracts *and such other preparations as have duplicate processes*, and that the general formula to be followed in any particular case be merely indicated by reference.

(12) *List of Reagents, Tables, etc.*—The tables and list of reagents authorized or prescribed for the Pharmacopœia of 1880 shall also be inserted in that of 1890, with such corrections or substitutions as may be required to bring them up to date.

(13) *Publication of the Pharmacopœia.*—It is recommended that the Committee of Revision, etc., which will be elected by the Convention of 1890, be authorized to print and publish, on its own account, the Seventh Decennial Revision of the Pharmacopœia of the United States of America.

(14) *Date for the Pharmacopœia to go into effect.*—The Committee shall announce in a conspicuous place, in the printed work, a definite date, reasonably distant from the actual date of publication, when the new Pharmacopœia is intended to go into effect, and to supersede the preceding one.

(15) *Compensation of Experts.*—It is recommended that the Convention of 1890 instruct the Committee of Revision, etc., to pay the experts and others employed in the preparation and publication of the Seventh Decennial Revision of the Pharmacopœia.

The discussion on these propositions, as might be expected, consumed much time, and in regard to some of them the views were extremely divergent. This was more particularly the case with propositions 2, 3, 4 and 10, of which the former three embrace the question of standardization; these after a lengthy debate were referred to the Committee of Revision without special instruction, after the word *usual* had been inserted in the second section in place of the word average. It will be observed that 2 and 3 are not mandatory.

Proposition 11 was modified by the addition of the words italicized above, apparently with the view of giving the direction a wider application.

When the 13th proposition was under consideration, an amendment was offered by Mr. Schafer, of Iowa, that the publication of the next Pharmacopœia be entrusted to a separate Committee of Five, the better to secure the entire profits expected to accrue from the sale of the work. The amendment, however, was voted down, as was also a substitute offered by Prof. Remington, with the object of making the instructions to the Committee still more definite than contained in the original draft which was finally adopted.

Proposition 10 had been postponed until the fourth session held on Thursday forenoon, when Prof. Mendenhall, upon invitation, addressed the Convention upon the subject of weights and measures and showed that those in use in the United States—with the exception of the metric system—were never legalized by Congress, but were adopted by regulation of one of the departments, and in several states by local legislation. He explained also the construction of the metric standards as now in the possession of the different governments, and showed models of those recently received from France.

When the discussion on proposition 10 was opened, it soon became apparent that the views of the members on the subject differed widely. While quite a number strongly favored the retention of parts by weight, others were strongly opposed thereto upong rounds whichdid not differ from the arguments used ten and more years ago. But those who favored the use of measures for liquids, though they appeared to be in the majority, were by no means united upon the kind of measure, since nearly all seemed to favor the closest and most simple relation between measures and weights; the metric system offered the only solution of the difficulty, and when the amendment recommending that system for adoption was put to vote, there was not a single nay heard in opposition. In going back to the use of measures of capacity, however, it was recognized that certain liquids, like acids, viscid oils, etc., are better adapted for weighing; and discretion was given to the Committee in this respect. The italicized portion of Section 10, as printed above, comprises the two amendments referred to.

After the adoption of the "principles" as a whole, a proposition was made and adopted, that at a suitable time preceding the next Convention in the year 1900, the President appoint a Committee of Seven to examine all the credentials prior to the day of meeting, so as to save much valuable time for the Convention. Some change has been made in regard to representation in the next Convention, whereby societies incorporated for not less than five years will be entitled to send delegates.

A motion made by Mr. Ebert was adopted that the sum of $1,000 be paid to Dr. Rice for his services as Chairman of the Committee of 1880, but Dr. Rice declined the compliment.

After final adjournment, most of the members participated in an excursion to Mount Vernon.

The Committee of Revision and Publication has effected an organization by electing Dr. Rice, Chairman; Prof. Remington, Dr. Edes and Prof. Dr. Curtman, Vice-Chairmen; Dr. Castle, Secretary, and Dr. Flint, Treasurer.

MINUTES OF THE PHARMACEUTICAL MEETING.

PHILADELPHIA, May 20, 1890.

Mr. Alonzo Robbins in the chair.

The minutes of the last meeting were read, and no corrections being required they were approved.

Mr. Beringer on behalf of Mr. Chas. E. Hires presented a lithographic reproduction of some photographs of the *vanilla plant* and the methods adopted in preparing the fruit for the market. A few notes on this subject, prepared by Mr. Hires were read, of which the following relate to the preparation of vanilla for the market.

"The beans are gathered in the fall—November, or early December, at which time the beans are nearly mature, and the process of curing commences at once, and takes from three to four months to complete, when the task of canning and bundling is proceeded with, which takes a month or two longer, so that the crop does not get to market until the spring or summer of the next year. The crop of 1890 will actually be the crop of 1889. In the early summer, the vanilla plant bears a beautiful white flower, which grow in clusters like the

lilac, of the most powerful perfume, somewhat resembling the scent of the tuberose. When first taken from the vine the fruit is often from two to three inches in circumference, but when cured, it is shriveled and nearly the size of a pipe stem, entirely unrecognizable from the green pod. When the weather is clear these beans are placed in rows on mats to dry, and are taken in in the evening, and are placed in caldrons and covered with blankets, where they go through the sweating process at night. At this time an oil oozes from the bean, which is carefully collected and preserved for future use when the beans are being bundled. They continue to go through this process of sweating and drying until the proper color and flavor is developed, and it is only those with long experience and thorough knowledge of the process, who are capable of producing the most fragrant and delicious flavor of the bean. As soon as the beans are sufficiently cured they are sorted in lengths, bundled, and packed in tins, four to six tins to the case, which are then shipped to our market. The bundles are made up by hands who have become dexterous in handling vanilla, and the oil which is collected from the sweating process, is then used, each bean being rubbed separately with the oil, so that the bundling, as well as the care and time required in their curing, is very tedious."

The subject of *Standardization* of drugs which formed a prominent feature of the meeting last month was called up, especially as to its treatment in the National Convention for revising the Pharmacopœia. The resolutions, relating to this matter, as adopted, were read.

Prof. Trimble read a paper upon a new material for the *adulteration of spices*, by Mr. Frank A. Hennessy, a member of the last graduating class; it was accompanied with specimens of the materials used in this nefarious trade. In reply to an inquiry as to whether the microscope could not detect such frauds in ground pepper, Prof. Maisch stated that the presence of starch could be shown, but since in the baking of the biscuits they had been subjected to a moist heat, nearly all of the starch grains would have been ruptured and thus the special kind of starch used in the adulteration could not be detected, while the small starch grains existing in pepper would still be intact. It had been suggested that a close approximation to the character of a pure pepper could be made by determining the ash or oleoresin, or both, the variations of which had been ascertained by a number of analyses; but even these could be imitated to some extent, leaving however such fraudulent mixtures destitute of the proper amount of piperine.

It was asked if the turmeric added to most of the *ground mustard* of commerce could be called an adulteration; this was answered by stating that any foreign matter was an adulterant in the strict sense, and yet mustard flour free from turmeric, if offered for sale, would in most cases be rejected and denounced as inferior by the public; its use cannot be objected to on hygienic grounds as it is but slightly stimulant and the amount used is too small to produce any harmful effect even if it were much more active.

A paper upon an *Indian Food Plant* was read by Prof. Trimble and listened to with much interest. Professor Maisch remarked that it was singular that a species of Peucedanum should be used as a food producer as these umbelliferous plants are generally very aromatic; quite a number of species of this genus and of the allied Ligusticum are indigenous to the Rocky Mountains and to the

Pacific Slope, and from one of them is probably derived an aromatic root somewhat resembling lovage, and which is said to be largely used in Colorado, where it is known as *Colorado cough root*.

A contrivance for *clamping* the cover glasses of microscopic slides was exhibited by Professor Maisch at the request of Mr. Wilder; it consists of a small brass frame pierced with a wire rod on which a thread is cut and around which a spiral spring is coiled; the spring presses the foot of the wire armed with a disk of cork down upon the glass cover, and to increase its power it is only necessary to turn the wire from left to right. It was designed by Professor Libby of Princeton and is made by Mr. T. H. McAllister, of New York, since about 1881.

Professor Maisch exhibited specimens of the following Mexican drugs, which he received lately from Professor Herrera, of Mexico:

The wood of the Lignaloe from *Amyris Linaloe* (see AMER. JOUR. PHAR., 1886, p. 21) is quite light colored and not so aromatic as some other kinds of wood sold as lignaloes. There is also a great difference in the character of the volatile oil as furnished by American and German distillers.

Doradilla—*Lycopodium nidiforme* (ibid., 1885, p. 554).

Habilla de San Ignacia, the seeds of *Hura crepitans* (ibid., p. 602.)

Goma Archipin—Copal de Penchi, *Rhus perniciosa* (ibid., p. 434).

Elaphrium copalliferum (ibid., p. 433); the resin is rather softer and has an odor resembling elemi.

Arbol del Perú is *Schinus Molle* (ibid., p. 340). The tree is quite ornamental in appearance and is also cultivated in California, where it is known as *pepper tree;* the fruit has a pepper-like taste; but black pepper is derived from a climbing vine.

Asenso del pais is *Artemisia mexicana* (ibid., p. 555). Though bitter, it appears to be less strongly aromatic than some of the numerous species of artemisia indigenous to the Western part of the North American continent, among which are the *sage-brushes* of the Western plains.

The various papers were referred to the Publication Committee and the thanks of the meeting were ordered to be tendered to Mr. C. E. Hires for the gift of the plates illustrating vanilla.

Mr. England called attention to the reaction which takes place between equal parts of *Salicylate of Sodium* and *Antipyrin*—if the dry powders are mixed together, in a short time the mixture becomes quite moist and finally deliquesces.

There being no further business, on motion adjourned until the 3d Tuesday in October, 1890. T. S. WIEGAND, *Registrar.*

PHARMACEUTICAL COLLEGES AND ASSOCIATIONS.

Alumni Association of the Philadelphia College of Pharmacy.—During the past winter six social meetings were held, at which lectures were given or papers read by Prof. H. D. Reed, Prof. H. Trimble, Dr. H. C. C. Maisch, Mr. H. G. French, Dr. J. L. Capen, Rev. J. Y. Burke, Dr. H. F. Hansel, Prof. J. Guiteras, H. Kingsbury, Ph.G., Dr. E. P. Davis and Evan Ellis, Ph.G.

The Microscopical Laboratory was better attended during the past session than in previous years, but yet not as largely as the importance of the subject would seem to require.

The Annual Meeting was held April 15, when W. Nelson Stem, class 1873, was elected President for the ensuing year; J. W. England, class 1883, and C. Carroll Meyer, class 1873, Vice-Presidents; E. C. Jones, class 1864, Treasurer; W. E. Krewson, class 1869, Recording Secretary; D. H. Ross, class 1878, Corresponding Secretary, and T. S. Wiegand, class 1844, Trustee of the Sinking Fund. The Treasurer reported a balance of $736.91 on hand.

The annual reception was held on the same evening in Association Hall. The Retiring President, Dr. B. Frank Scholl, presiding. The Alumni gold medal for the highest standing at the examinations for graduation was presented to J. W. Morrison, of Nova Scotia. The recipients of the alumni certificates for best examination in the respective branches were W. Schleif, Jr., of Wisconsin, in materia medica; L. A. Schoppe, of Missouri, in pharmacy; E. G. Eberhardt, of Indiana, in chemistry; W. A. Johnson, of Pennsylvania, in general pharmacy; G. D. Feidt, of Maryland, in operative pharmacy; J. L. Crothers, of Maryland, in analytical chemistry, and F. M. Apple, of Pennsylvania, in specimens. The junior examination certificate was presented to H. T. Hicks, of North Carolina.

The class oration was given by F. A. Hennessy. The Class Prophet was F. Dunning, of Maryland; F. H. Smith, of Massachusetts, the Class Historian, and S. T. Hamberg, of Pennsylvania, the Class Poet.

A telegram was received from the Colorado Alumni of the Philadelphia College of Pharmacy, who were holding their annual reunion in Denver. The exercises were interspersed with music from the orchestra of students, and with songs from the Zeta Phi Glee Club.

The Association has now 1,700 members, residing in all parts of North America. The loss by death during the year was 14.

The Colorado Alumni Association of the Philadelphia College of Pharmacy elected officers for the current year at Denver. President, C. W. Lippincott; Vice-President, W. W. Beitenman; Secretary and Treasurer, F. A. Lynneman. A committee of five was appointed to consult with the graduates of other reputable colleges of pharmacy with the view of organizing a State Alumni Association; also to promote as much as possible the organization of a State Pharmaceutical Association. The annual reunion took place on the evening of April 15.

The California College of Pharmacy commenced the 18th annual course of lectures April 7, when addresses were made by the President of the University of California, Hon. H. Davis, and by Mr. H. Breckenfeld, the latter being in connection with a microscopical exhibition.

Commencements have been held by the following Colleges of Pharmacy:

Albany, N. Y.—March 11, at Germain Hall. 18 graduates. F. S. Veeder received the senior prize, and H. E. Walker the junior prize.

Buffalo, N. Y.—March 25, at Music Hall. 16 graduates. Prizes were awarded to J. J. Matthews, H. C. Cleveland and the junior prize to P. Escher.

Cincinnati.—March 19, at Music Hall. 23 graduates. Prizes were awarded to six graduates and four juniors.

Denver, Col.—April 17, at Trinity M. E. Church. 4 graduates.

Kansas City, Mo.—5 graduates.

Louisville, Ky.—March 7, at Macauley's Theatre. 18 graduates. Three senior and one junior prizes were awarded.

Maryland, Baltimore.—April 16, at Lyceum Theatre. 43 graduates. Prizes were awarded to J. A. Hardison, S. A. Williams, E. G. Stewart, A. J. McGlannan and W. Tarun.

Massachusetts, Boston.—May 21, at Association Hall. 28 graduates.

National, Washington, D. C.—May 20, at Lincoln Music Hall. 18 graduates.

New York City.—April 29, at the Metropolitan Opera House. 93 graduates. J. P. Arnold, A. Stierle and W. J. M. Robinson were the recipients of prizes.

Pittsburgh, Pa.—March 25. 11 graduates.

Purdue, Lafayette, Ind.—March 19. 16 graduates.

St. Louis, Mo.—March 19, at Memorial Hall. 42 graduates. Eight of the graduates were recipients of prizes.

Tulane, New Orleans, La.—April 1. 10 graduates.

The Delaware Pharmaceutical Association met in Wilmington, May 1, President H. R. Bringhurst in the chair. In his annual address the President advocated the thorough education of the pharmacists and their attendance at a school of pharmacy and graduating; the establishment of such a school in Wilmington was suggested. A report on trade interests by Z. J. Belt discussed the necessity of a more stringent pharmacy law, the organization of county societies, the reduction of the tax on alcohol, etc. A paper on *adulterations* was read by H. K. Watson, and one on *ultramarin in sugar* by J. M. Harvey. In the evening, a banquet was served in Eden Hall.

The Florida Pharmaceutical Association held its annual meeting at Tampa, April 8. Discussions of the officers' reports and of six or seven papers occupied the attention of the meeting. The officers elected for the ensuing year are: W. A. Rawls, Tallahassee, President; S. P. Watson, Jacksonville, Secretary, and E. Delouest, Ocala, Treasurer. The Association adjourned to meet in Jacksonville, May 20, 1891.

The Georgia Pharmaceutical Association convened in Macon, April 15, President Cheatham presiding. An address was presented by the President, amendments to the constitution and by-laws were adopted, and papers were read by J. W. Goodwyn on *hollow suppositories;* by C. M. Crosby on *stock of proprietary medicines*, and by H. R. Slack, Jr., on *toxicological analysis of the stomach.* The next meeting will take place at Augusta, May 14, 1891. The present officers are: J. W. Goodwyn, Macon, President; H. R. Slack, Jr., La Grange, Secretary; M. H. Taylor, Macon, Treasurer, and J. P. Smith, Augusta, Local Secretary.

The Louisiana Pharmaceutical Association had it eighth annual meeting in New Orleans, April 9, and was welcomed by Mayor J. A. Shakespeare. President Brooks and the different officers and committees presented their reports, which were fully discussed, amendments to the pharmacy law claiming much of the attention; likewise the Tulane University Pharmacy School, for which a number of subscriptions were procured. M. T. Breslin, Orleans, was elected President; Mrs. E. Rudolph, Corresponding Secretary, M. T. Chalin, Recording Secretary, and E. Lalmant, Treasurer. The next meeting will again be held in New Orleans, on the second Wednesday of April, 1891.

EDITORIALS.

The State Pharmaceutical Examining Board, of Pennsylvania, held examinations in Philadelphia on January 7, and at Harrisburg on April 29. The results were as follows:

Candidates, registered pharmacist, January, 52; passed, 15.
Candidates, registered pharmacist, April, 94; passed, 39.
Candidates, qualified assistant, January, 54; passed, 28.
Candidates, qualified assistant, April, 47; passed, 28.

A National Adulteration Bill is pending before Congress. Its object is claimed to be the prevention of adulteration and of the misbranding of food and drugs. It provides for the organization of a food division in the department of agriculture, with a chief (salary, $3,000) who is to procure and analyze, with the assistance of chemists, inspectors, clerks, laborers and other employés, samples of food and drugs sold in states other than where manufactured, and to publish the results monthly, giving also in the case of adulterations, the name of the manufacturer, brand, etc. The importation of adulterated foods and drugs from any state or territory or from a foreign country is prohibited, and the shipment (knowingly), delivery, receiving or sale of such goods is made a misdemeanor, the fine being for the first offence not exceeding $200, and for subsequent offences not over $300, or imprisonment not exceeding one year, or both. The U. S. District Attorneys are to prosecute all violations of the act. Penalties similar to the foregoing are also to be inflicted upon those who ship, deliver, receive or sell for exportation to another state or foreign country any compound article of food or compounded drug not accompanied by the label or brand to be authorized by the Secretary of Agriculture, the designation to be distinctive or descriptive, though not necessarily containing the word "mixture" or "compound." The counterfeiter of a label or brand can be fined only $100 without imprisonment and is, therefore, less of a criminal than the manufacturer who fails to procure the prescribed license. The license is issued for $10 by the Secretary of Agriculture to such manufacturer, manipulator, compounder or mixer of compound food or compounded drugs intended for shipment, etc., who certifies that the article is not deleterious or injurious to health, and who agrees to label or brand the article as approved by the Secretary. The license together with the label or brand is to be lawful evidence to transportation companies of compliance with this law. The Secretary may require the ingredients of any of these compounds to be published on the label, but no formula of a proprietary article is to be made public, if the article is not injurious to health, and is properly licensed and labelled. All moneys received are to be expended for carrying out the provisions of the act.

The term "drug" is to include all medicines for internal or external use, and these are to be deemed adulterated, if, where sold by a name recognized in the U. S. Pharmacopœia, some other Pharmacopœia or standard work on materia medica, the article differs from the standard of strength, quality or purity according to the tests laid down in such work; or if the strength or purity fall below the professed standard under which the article is sold.

The term food is to include every article of food or drink used by man other

than drugs or water, and such is to be deemed adulterated, (1) if mixed and packed with any substance so as to reduce or injuriously affect its quality, and tend to deceive the purchaser; (2) if any inferior substance has been substituted wholly or in part for the article; (3) if any valuable constituent has been wholly or in part abstracted; (4) if it be an imitation of and sold under the specific name of another article; (5) if it be mixed, colored, powdered or stained to conceal damage; (6) if any poisonous or injurious ingredient has been added; (7) if it consist of any diseased, filthy, decomposed or putrid animal or vegetable substance, or of the product of a diseased animal, or of an animal that has died otherwise than by slaughter.

An article of food or drug, not mixed with a poisonous ingredient, shall not be deemed to be adulterated, (1) if a mixture or compound known as an article of food under a distinctive name and not included in definition 4 (imitation); (2) if labelled so as to plainly indicate that it is a mixture, compound, combination or blend; (3) if anything has been added to the food or drug required for the production as an article of commerce in a state fit for carriage or consumption, and not fraudulently to increase bulk, weight or measure, or to conceal inferior quality; (4) if the food or drug become unavoidably mixed with some extraneous matter in the process of collection or preparation; (5) in the cases exempted by Section 3,436 of the Revised Statutes of the U. S.

The last section provides that the Oleomargarin Act, approved August 6, 1886, is not to be modified by the present bill.

We have given a full synopsis of this bill so as to enable our readers to judge of its vexatious character intelligently. We do not believe that there was ever in any country a law framed which under the pretense of preventing adulteration, was equally crude and at the same time oppressive. It is obvious that under the guise of proprietary articles of food and drink—"the formulas of which shall not be made public"—adulteration could be carried on to an unlimited extent even with the apparent sanction of the Government. While the bill defines the terms food and drug, it is silent as to the meaning of the terms compound food and compounded drug. The bill evidently intends that substances derived directly from the animal or vegetable kingdom, like tea, coffee, rice, milk, meat, and the like, be regarded as simple articles of food. But bread, cakes, candy, chocolate, etc., are not such simples, and since they are "manufactured, manipulated, compounded or mixed articles," it would seem that a license would be required for transporting them from one state to another. In regard to medicines the bill speaks of compound*ed* drugs (not compound). But whether a drug becomes compounded by dividing it in packages of (say) one ounce or pound each, or only after dividing it into separate doses, the proposed law gives no information; nevertheless, a license would be necessary if compounded drugs be shipped to another state, and even pharmacopœial compounds could thus be taxed, because they are not specially exempted.

It is not our intention to criticise the various provisions of the bill, its absurdities and crudities are quite apparent. Several bodies have protested against this proposed measure, and a Committee of the Philadelphia Drug Exchange and of the National Wholesale Drug Association, explained their views in opposition of the bill to the Senate Committee on Agriculture, and

submitted as an acceptable substitute a bill drawn upon the lines of the British law. In the following preamble and resolutions which were proposed by Mr. A. H. Jones and adopted by the Drug Exchange, May 17, the most prominent objectionable features of this bill are plainly set forth:

"WHEREAS, There is now under consideration by the Committee on Agriculture and Forestry, United States Senate, a bill entitled a bill 'for preventing adulteration and misbranding food and drugs, and the prevention of poisonous adulterations, and for other purposes;' and

"WHEREAS, The title is misleading, inasmuch as it does not, in any manner, regulate adulteration of food and drugs within the limits of the respective States and Territories, but aims to control the commerce in food and drugs between the several States and Territories of this Union, as the enacting clause clearly sets forth; and

"WHEREAS, The bill proposes to overturn business methods long established, and in all respects proper and mercantile; restrict and embarrass trade between citizens of the different States and Territories; trample upon vested rights, and impose regulations as burdensome, arbitrary, exceptional and indefensible, as they are needless, upon a class of American citizens engaged in lawful and honorable calling, from which other citizens are exempt and to be exempted: and

"WHEREAS, The design of the bill is to place the manufacture and sale of all drugs, medicinal chemicals, pharmaceutical preparations and proprietary medicines, as far as practicable, under the arbitrary management of the Secretary of Agriculture, and to impose taxes, under the guise of licenses, so as to force us to assist in defraying the expenses of a department of the Government, with which we are in no way allied; and

"WHEREAS, The bill is unfriendly to us in conception—the agitation of the subject being largely due to the efforts on the part of certain parties interested in Farmers' Alliances to secure signatures to petitions printed and circulated so as to influence the Committee on Agriculture and exaggerate the extent of adulteration; and

"WHEREAS, The bill is faulty in construction—as may readily be comprehended when the members of the Committee on Agriculture confessedly were so ignorant of the subject as to be unable to define what a compounded drug meant, according to their own bill; and

"WHEREAS, The bill is tyrannical in its provisions, demanding that even manufacturers of articles prepared according to the United States Pharmacopœia, and other standard works on materia medica, shall apply to the Secretary of Agriculture for a license to transport their products out of their own States and Territories; insisting that all private formulas shall be submitted to the Secretary, and giving him authority to decide which may and may not be made, if intended to go throughout the United States; imposing not only fines, but imprisonment; conferring autocratic powers on one man to humiliate an honorable body of American citizens and to extort money from them; therefore, be it

"*Resolved*, That we are opposed to all needless interference with the commerce between the States and the Territories.

"*Resolved*, That inasmuch as we are engaged in a business thoroughly

legitimate and essential to the welfare of the people, we claim to have the same rights to-day that we have always had, and demand the same privileges that are accorded to other American manufacturers and dealers.

"*Resolved*, That we denounce this attempt to extort a tax, under the flimsy guise of a license, to help pay the expenses of the Agricultural Department; we deny that the exigencies of the case call for an arbitrary interference with our business; we condemn this attempt to put us under the control of an imperious chief of a division or Secretary of a department, with whom we have never had any connection whatever, and never can have any analogical relation so long as agriculture and materia medica remain separate and distinct.

"*Resolved*, That we shall oppose such inconsiderate, unjust and partial legislation, believing that this is the proper and only course for us to pursue as free American citizens."

Committees of druggists from New York and Philadelphia had a hearing before the Senate Committee, May 27, and learned that the bill had been entirely remodelled upon the basis of the one submitted by the former Committee, and that the objectionable features had been eliminated.

Lactose and Glucose, according to the observations made by Dr. Sophie Meilach(*Bull. Gén. de Thérap.*, 1890, p. 24–39), are powerful diuretics. They do not produce any nervous troubles, and do not pass into the urine, but are burned up in the organism. The dose of lactose is 100 gm. for 2 liters of liquid. A syrup containing 75 per cent. of glucose produces its maximum effect in the dose of 200 gm.; 150 gm. cause an abundant polyuria, and 100 gm. suffice for giving a diuresis greater than normal.—See also AMER. JOUR. OF PHARM., 1889, p. 417.

REVIEWS AND BIBLIOGRAPHICAL NOTICES.

Poisons and Their Antidotes.—St. Louis, Mo. Druggist Publishing Co.

A chart arranged in tabular form and in alphabetical order for convenience of reference, giving the common poisonous compounds and their antidotes. The treatment is described with sufficient details for practical application. In some cases where particular indications require special treatment, the symptoms are also described, and, when necessary, the mode of preparing antidotes. which cannot be kept on hand ready made, is indicated. The chart will serve a useful purpose to apothecaries and others who, in cases of emergency and in the absence of a physician, may be called upon to administer antidotes in cases of poisoning.

Uses, tests for purity and preparation of chemical reagents employed in qualitative, quantitative, volumetric, docimastic, microscopic and petrographic analyses, with a supplement on the use of the spectroscope. By Charles O. Curtman, M.D., Professor of Chemistry and Director of Chemical Laboratory in the Missouri Medical College. With twelve plates. St. Louis, Mo.: J. L. Boland Book and Stationery Co. 1890. pp. 256. Price, cloth, $1.75; leather, $2.25.

An excellent and very useful work for all who are engaged in analytical researches. It gives full and reliable information on almost any question con-

nected with the reagents used in chemical analysis. The aim of the work, as is well expressed by its title, is to give an account of the various uses to which the different reagents are applied, to prove their purity and to show the manner in which they may be prepared. It will thus serve as a supplement to the various manuals intended for the systematic instruction in analytical chemistry, and to the larger works on chemical analysis used by the professional analyst. The arrangement of the work is alphabetical, commencing with the various acids and terminating with zinc and its compounds. The group alcohols includes glycerin, and under the heading color-reagents and indicators, those numerous agents are found which give different color-compounds with acids and alkalies, each reagent is considered first as to its uses; next, the tests are given, by which its identity and purity may be ascertained, and finally one or more processes are outlined, by which the reagent may be conveniently prepared or the commercial article purified. The various applications of the reagents are briefly mentioned when they apply to well-known analytical methods. But a fuller description is given for processes of special application or less familiarly known. As an example of the author's method of treating the subject, and also to some extent of the scope of the work. We transcribe from page 175 the paragraph referring to the uses of resorcin, which is as follows:

Resorcin, or *Meta-diozy-benzol*, is a very delicate reagent for chloroform, iodoform and chloral hydrate. When a small quantity of resorcin is dissolved in a slight excess of potassium hydrate solution, it produces an intense red color, due to the formation of rosolic acid, on heating it even with traces of iodoform (*Lustgarten*) chloroform or chloral hydrate (*Schwarz*). The reaction is especially adapted to finding traces of these substances in urine. Small amounts of ferric chloride may be identified by this reagent by producing a violet blue color. It also serves for the detection of saccharin, Fahlberg (ortho-sulphamine benzoic anhydride, or benzoic acid sulphinide, C_6H_4 CO. SO. NH.), which is now extensively used as a substitute for sugar; on addition of resorcin and a few drops of concentrated sulphuric acid to a small amount of saccharin and heating, the liquid assumes, in succession, a yellow, red and then a dark green color, while SO_2 escapes with effervescence. If, after cessation of this effervescence, the liquid is made slightly alkaline by potassium hydrate, a strong green fluorescence indicates the presence of saccharin (*Ira remsen*). It is also used for the detection of carbohydrates (*Ihl*, modified by *Molisch*), especially glucose, which gives a red color when brought together with an alcoholic solution of resorcin and floated on concentrated sulphuric acid. By melting resorcin with sodium hydrate phloroglucin is obtained. Mol. W. = 109·764.

The tests for the same substance are given in the following: Resorcin forms small, colorless rhombic prisms, melting at 110°C., subliming at 276·5°. It dissolves in 0·67 parts of water at 12·5°C. and easily in alcohol and ether. Its aqueous solution should not form a precipitate with lead acetate (absence of pyrocatechin). It should sublime without residue. The commercial article is sufficiently pure if not browned by exposure to air and light. If such is the case, it must be carefully resublimed.

The following paragraph on the preparation of resorcin is equally instructive, and the same must be said of the chapter on the use of the spectroscope, which covers thirteen pages and is illustrated, upon plates, with outlines of the

apparatus and with the spectra of the sun of about a dozen metals and of a number of organic compounds.

The book, notwithstanding the convenient alphabetical arrangement, is provided with a good general index, containing also the synonymous terms used for the reagents, and with a second index giving in alphabetical order the names of the different inorganic and organic compounds, with the tests applied to them, and in each case with references to the page of the work where the more detailed information is to be found.

It will be seen from the above that we regard the work as a very meritorious one, containing information which is widely scattered throughout the chemical literature, and its value and reliability is enhanced by the care bestowed upon its preparation, it being evident that the author is not only familiar with the literature of the subject, but is also practically acquainted with the various reagents and methods described, and with their relative value for the purposes for which they have been recommended. The book fills a want, and since that want is well filled, it deserves a place in every library intended for consultation in connection with chemical analytical work.

A New Medical Dictionary; including all the Words and Phrases used in Medicine, with their proper Pronunciations and Definitions, based on Recent Medical Literature. By George M. Gould, B.A., M.D., Ophthalmic Surgeon to the Philadelphia Hospital, etc. With Tables of the Bacilli, Micrococci, Leucomaïnes, Ptomaïnes, etc., of the Arteries, Muscles, Nerves, Ganglia and Plexuses; of Weights and Measures, Thermometers, etc.; and Appendices containing Classified Tables, with Analyses of the Waters of the Mineral Springs of United States, and Tables of Vital Statistics. Small octavo, 520 pages. Half Dark Leather, $3.25; Half Morocco, Thumb Index, $4.25. Philadelphia: P. Blakiston, Son & Co.

Compactness and logicalness of arrangement, conciseness of definitions, elimination of the useless and convenience of size and price—such are the aims, as stated by the author, which guided him in preparing the volume before us; and to these must be added the endeavor to include those new words and phrases created during the past ten years which appeared destined to continuous usage. These objects, on the whole, have been well accomplished. The occasional erroneous accentuation of a word—as, f. i., Anthemis, p. 44; Viridis, p. 258, and Oleum, pp. 313, 384 and 400—is evidently due to oversight. But in a number of cases errors are noticed which can scarcely be attributed to the same cause. Thus we find on p. 44 Antharobin, instead of Anthr*a*robin; on pp. 44 and 107, Chrysobarin, instead of Chrys*arobin;* on pp. 56 and 373, Aspi*dio*-sperma, etc. The horse-chestnut is spelled Esculus (Æsculus). Under Coco or Cocoa, p. 112, Theobroma is referred to, but nothing is said of Cocos. Uncertainties are observed due to the otherwise commendable aim of briefness and for economizing space, thus Ol. is used for Oleum as well as for Oleatum; Pelargonic Acid is defined as a Complex Ether; The Latin terms Artemisia, Gynocardia, Heracleum, Paullinia and others have been omitted, though the corresponding English terms are assigned to their proper places.

A number of carefully prepared tables have been admitted in the text in appropriate places, such as tables of arteries, bacilli, micrococci, muscles,

nerves, etc.; and in the Appendix are found a very valuable account of the mineral springs of the United States, and numerous interesting tables on vital statistics. The preliminary pages contain also some valuable reference tables, namely, lists of abbreviations, prefixes, suffixes, etc.

The mechanical part of the work is very inviting. The shortcomings which we have pointed out are such as are likely to happen in the first edition of such a work; they do not seriously affect its value as a reliable book of reference, and as such it will doubtless be found valuable by those consulting it.

The Extra Pharmacopœia, with the additions introduced into the British Pharmacopœia, 1885. By Wm. Martindale, F.C.S., etc. Medical References and a Therapeutic Index of Diseases and Symptoms, by W. Wynn Westcott, M. B. Lond., etc. Sixth edition. London: H. K. Lewis. 1890. p. 485.

The preceding edition of this work was noticed by us in the issue for October, 1888. Compared with the present edition, the text of the latter is found to have been in part rewritten, deleted and condensed, so as to make room for the new material, among which we find phenylacetic, phenylpropionic, and trichloracetic acids, anthrarobin, cresalol, chloralamide, benzanilide, monobromanilide, exalgin, hydracetin, methacetin, orexine, safrol, thiol, thioresorcin, somnal, ural and others. The work, from the time of its first appearance, has met with great favor, because dealing with extra-pharmacopœial compounds and preparations. It is an excellent reference book for this class of medicines, which during recent years have been introduced in great numbers. Regarding some of these preparations, we desire to quote from the author's preface a short paragraph to which we have not previously referred, and in which they hold "that the art of pharmacy should tend towards making medicines palatable, but not at the expense of their efficacy; they should be combined extemporaneously to suit the disease; the reverse method should be avoided, in which the patient is treated by ready-made compounds, prepared to suit imaginary cases, as is too much the tendency of the present day."

Pharmacographia Indica. A History of the Principal Drugs of Vegetable Origin, Met with in India. By Wm. Dymock, Brigade Surgeon, Bombay Army, etc.; C. J. H. Warden, Surgeon-Major, Bengal Army, etc., and D. Hooper, Quinologist to the Government of Madras, Ootacamund. London: Kegan Paul, Trench, Trübner & Co. 1890.

In our issue of last October, we commented on the first part of this excellent and important work, and endeavored to give an idea of its scope and arrangement. We have now before us Part II, which concludes the first volume of 600 pages. It concludes with the drugs from the order of Rhizophoreæ, leaving about a dozen orders of the polypetalous dicotyledons to be considered, several of which are of considerable importance, owing to the drugs derived from them, or to the number of species belonging thereto. The most important orders in the part now before us are Burseraceæ, Anacardiaceæ, Leguminosæ and Rosaceæ, all of which furnish a number of important drugs used in India, many of which are but little known outside of that country. The drugs are too numerous to be mentioned in a review of the work, but we are satisfied that we shall frequently have occasion to refer to Pharmacographia Indica for reliable information on Indian drugs, and more particularly such which are not, or only to

a limited extent, articles of the European or American commerce. Part II is fully equal to Part I in interest and completeness of information. The work is to be recommended to all interested in Materia Medica, and more particularly that of the East Indies.

OBITUARY.

N. Spencer Thomas, Ph.G., died suddenly, at his residence, Elmira, N. Y., on the 30th day of March, 1890. Mr. Thomas was born in the year 1827, in Bucks County, Pennsylvania. He entered, at an early age, the retail drug store of Robert Shoemaker, Philadelphia, where, after a faithful service of seven years as an apprentice, he graduated from the Philadelphia College of Pharmacy, Class of 1847. In 1850, he entered into business as a manufacturing pharmaceutist, establishing a laboratory on New Market and Canal Streets, this city. For several years he did a prosperous business, enlarging and improving his quarters from time to time. The loss, by fire, of his entire establishment, with inadequate insurance, resulted in financial embarrassment. Mr. Thomas removed to Painted Post, N. Y., where he established a laboratory for the manufacture of Extract of Hemlock for tanning purposes. His business grew to large proportions, his manufacture of fluid and solid extracts of tannin barks meeting with ready sale, both in this country and Europe. Later, he added to his extracts the "Peerless Dyes," of which he was the proprietor at the time of his death. He resided in Elmira for several years prior to his death, being regarded as one of its most enterprising citizens. S.

Carl Jacob Loewig, professor of chemistry at the University of Breslau, died in that city, March 27, at the age of 87 years. He was born at Kreuznach in 1803, became a pharmacist, studied chemistry at Heidelberg under Gmelin, and at Berlin under Mitscherlich and Rose, was then lecturer on chemistry at the University of Heidelberg from 1830 to 1833, when he accepted a call to the chair of chemistry at the University of Zurich, and in 1853, as the successor of Bunsen, to the same chair in Breslau. He continued in this position until about a year ago, at the beginning of the 118th semester of his lectures, he was injured by a fall and incapacitated for further activity in scientific pursuits. He was the author of a monograph on bromine (1829) of a chemistry of organic compounds, of outlines (Grundriss) of organic chemistry, etc. He analyzed a number of mineral waters, studied the influence of alkali metals, amalgams, alkali sulphides, acids, etc., upon alcohols and allied compounds, investigated the acrid principle of ranunculaceæ "anemonin," a number of volatile oils, like those of parsley, spiræa ulmaria, prunus padus, etc., and devoted much of his time to study of the constitution of organic compounds. The volumes of this journal published nearly sixty years ago contain translations of several of his writings. The deceased was revered by his numerous pupils for his profound knowledge, no less than for his qualities as a teacher.

Joseph Schrenk, professor of pharmacognosy in the New York College of Pharmacy, died in Hoboken, March 10. He was a native of Hungary, and in this country was connected with several educational institutions, since 1881 with the college named. He was an active botanist and an accomplished microscopist.

George Thurber, M.D., died near Passaic, N. J., April 2, aged 69 years. He was a native of Rhode Island, and was formerly a pharmacist, devoting his energies to the study of botany, and also to chemistry. His explorations of the botany of various sections and localities in North America form valuable contributions to botanical science. He was professor of botany and materia medica in the New York College of Pharmacy from 1856 to 1861, was connected for several years with the State Agricultural College of Michigan at Lansing, and for a long period was editor of *The American Agriculturist*, until failing health compelled his retirement.

VARIETIES.

Preparation of Aseptic Catgut.—Brunner has recently studied the methods of disinfecting catgut for surgical purposes (*Schmidt's Jahrbücher*, No. 3, 1890), and believes that raw catgut is easily rendered aseptic. His method of preparing it is as follows: The catgut is first scrubbed with a potash soap, then placed for twelve hours in ether, and then for a time in a 1 : 1000 watery solution of sublimate. It is preserved in a solution composed of sublimate 1 part, glycerine 100 parts, absolute alcohol 900 parts. Before using, the gut must be placed in 1 : 1000 watery sublimate solution.

The author's experience with gut prepared in this manner shows that it is absolutely safe and unirritating to the tissue.

Referring to the use of silk and linen sutures and ligatures, Brunner says that though they may be thoroughly disinfected by boiling, experience has shown that even then, if placed deeply in the tissue, they will occasionally excite suppuration.—*Medical News, April 12.*

Peruvian Balsam in Local Tuberculosis.—According to the *Provincial Medical Journal*, Dr. Jasinski, of Warsaw, has used Peruvian balsam in thirty-one cases of local tuberculosis of the bones and skin with excellent results. The drug was used either in substance or in an alcoholic mixture, and was in some cases applied as a dressing, in others was injected into tuberculous cavities. In all but one of the cases healing ensued more or less rapidly.—*Med. News*, May 10, 1890.

The Inefficiency of Sand Filters.—Drs. Frankel and Piefke, of Berlin, have recently made an exhaustive study on the filtration of drinking water through sand (*Zeitschrift für Hygiene*, No. 1, 1890). Their experiments conclusively prove that the danger of infection from impure water is only slightly reduced by filtration through sand; bacteria passing through at all times, but in larger numbers just after the filter has been cleaned and again after it has been in use for some time.—*Med. News*, May 10, 1890.

Salicylate of sodium in general pruritus.—Dr. Wertheimer, in the *Münchener medicinische Wochenschrift*, advises the treatment of general pruritus by means of a three-per-cent. solution of sodium salicylate, in doses of a tablespoonful thrice daily. This plan of treatment, he says, may be continued for some time, in the confident belief that it will not only promptly moderate the unpleasant pruritic symptoms, but also radically remove the underlying disease.—*N. Y. Med. Jour.*, Mar. 8.

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THE BOTANICAL ORIGIN OF SOME PHARMACOPŒIAL DRUGS.

By John M. Maisch.

Read before the Pennsylvania Pharmaceutical Association at York, June 11.

The recent publication of the sixth edition of Gray's Manual of the Botany of the Northern United States, and the fact that this standard work has been thoroughly revised and extended by Professors Sereno Watson and John M. Coulter, naturally lead to a comparison of its authoritative statements with those of the present Pharmacopœia, and invite further inquiries concerning drugs derived from either indigenous or naturalized plants. The following fragmentary notes have thus originated; they cannot lay claim to completeness, but are reported now with the view of inducing others to similar investigations.

Prickly ash bark is obtained from two species of Xanthoxylum, which are usually distinguished as the Northern and Southern prickly ash. The botanical nomenclature of both species has been rather confused in the past, and it may therefore not be considered out of place to briefly mention the various synonyms which are quoted in full in the excellent "Report on the Forests of North America," by Prof. C. S. Sargent, issued in 1884 as one of the supplemental reports of the tenth census.

X. americanum, *Miller*, is the Northern prickly ash, and the following are synonyms for the same plant: X. Clava-Herculis, *Lamarck* (not Linné); X. fraxinifolium, *Marshall;* X. fraxineum, *Willdenow;* X. mite, *Willdenow;* X. ramiflorum, *Michaux;* X. tricarpum, *Hooker*, and Thylax fraxineum, *Rafinesque*. It is shrubby,

or a small tree not often 7 meters high, with a trunk 0·15 to 0 20 meter in diameter. Its habitat is on rocky hillsides, or more frequently along streams and rich river bottoms, from Massachusetts west to northern Minnesota, eastern Nebraska and eastern Kansas, south to the mountains of Virginia and northern Missouri; its greatest development being reached in the region of the great lakes.

The southern prickly ash is now called X. Clava-Herculis, *Linné.* To this name there are the following synonyms (see Sargent, Forests, page 30):

X. fraxinifolium, *Walter* (not Marshall); Fagara fraxinifolia *Lamarck;* X. carolinianum, *Lamarck;* X. aromaticum, *Willdenow;* X. tricarpum, *Michaux;* Kampmania fraxinifolia, Pseudopetalon glandulosum, Ps. tricarpum, and X. Catesbianum, the last four names being used by *Rafinesque* in his different writings. The plant is popularly known as toothache tree, prickly ash, tea ash, pepper wood and wild orange. According to Schoepf's *Materia Medica Americana*, page 148, it was known here during the past century as toothache pellitory. Its habitat, varieties, etc., are thus given in the Report on the Forests:

Southern Virginia, southward near the coast to bay Biscayne and Tampa bay, Florida, westward through the Gulf states to Northwestern Louisiana, southern Arkansas (south of the Arkansas river), and the valley of the Brazos river, Texas. A small tree rarely 12 to 14 meters in height, with a trunk 0·30 meter in diameter, of very rapid growth; usually along streams and low rich river bottoms, reaching its greatest development in southern Arkansas, Louisiana and eastern Texas.

A form with trifoliate leaves is X. macrophyllum, *Nuttall*, Sylva iii, 10.

The variety fruticosum, *Gray* (X. hirsutum, *Buckley*), is a low shrub or on the Texas coast a small tree 6 to 8 meters in height, with a trunk 0·20 to 0·30 meter in diameter.

Grisebach (Flora, British West Indian Islands, p. 138) regarded this species as being identical with X. lanceolatum, *Poiret*, and X. caribæum, *Lamarck*, and states that it is found in Jamaica and all the British West Indian colonies; also in Cuba, Guadeloupe, etc. De Candolle (Prodromus i, 727) regarded X. lanceolatum, *Poiret*, as a species distinct from X. Clava-Herculis, *Lin.*, and X. caribæum, *Lamarck* (not Gaertner), as identical with the latter, the habitat being the forests of the Caribbean Islands.

But X. caribæum, *Lamarck*, is now recognized as entirely distinct from the Hercules club; it is the *satinwood* of semitropical Florida and the West Indies, and the following synonyms are given by Prof. Sargent: X. Clava-Herculis, *Linné*, in part (also De Candolle, Prodromus and Grisebach, Flora of the West Indian Islands); X. lanceolatum, *Poiret*, and X. floridanum, *Nuttall*. According to Chapman's Flora of the Southern United States, its branches and petioles are unarmed.

To what extent the barks of these evidently closely related species agree, it is impossible to say in the absence of well authenticated specimens. But it should be stated that for some years past the southern prickly ash of our market has to some extent differed in macroscopic appearance from that formerly seen, the chief difference being the reduced number or almost total absence of the stout spines with which the branches of our southern plant are armed, they being replaced by numerous large conical corky excrescences. Since the anatomical structure does not differ materially from that of the bark formerly met with, it is not unlikely that the present bark may be derived exclusively from the trunk and older branches. I hope to soon procure authentic botanical specimens, when this question may be definitely settled. If the opinion expressed here be the correct explanation, it would appear that the present gatherers of southern prickly ash bark were not as considerate as those of thirty or forty years ago when the bark of the branches was exclusively or chiefly collected; such a course did not destroy the tree, which must necessarily be the case if the trunk itself be stripped of its bark.

But another interesting question arises in connection with the nomenclature adopted by the new edition of the Manual, and in view of the results obtained by chemical analysis. The southern prickly ask bark was chemically investigated by Geo. H. Colton (Amer. Jour. Phar., 1880, p. 191), E. T. Moffitt (ibid., 1886, p. 417) and E. G. Eberhardt (ibid., 1890, p. 231), who established the presence of an alkaloid, which, however, does not show any similarity with berberine. This latter alkaloid was isolated by J. D. Perrins nearly thirty years ago (ibid., 1863, p. 459) from the bark of the Caribbean X. Clava-Herculis, *Lin* , and had been described by Chevallier and Pelletan as early as 1826 under the name of *Xanthopicrite*. Mr. Perrins' bark was furnished by Daniel Hanbury, and

agreed with Martiny's description in being of a "highly laminated texture, splitting readily into thin plates like garden bast;" Perrins adds that this bark must not be confounded with that of X. Clava-Herculis, *Lamarck*, the latter species being totally distinct; as above shown it is our Northern prickly ash.

The distinction in these physical characters was pointed out by Bridges (Proceedings, Am. Phar. Assoc., 1864, p. 272), when he established the source of our Southern prickly ash bark from specimens collected by Mr. Wm. Heyser, of Chambersburg, Pa. Dr. Bridges also quoted from Spach's Histoire Naturelle a distinctive characteristic to be found in the spines which in the Caribbean species are "short, in pairs, and dilated at the base," while those of our southern species are "very pointed, and strongly dilated at the base, sometimes attaining an inch in diameter."

A fuller description of the West Indian xanthoxylum bark is given by Guibourt (Histoire Naturelle des drogues simples, iii, 513) who states that "the bark of the *clavalier jaune* (yellow Hercules club) or *épineux jaune des Antilles* (yellow-thorn) has some resemblance to the true augustura bark, is thin, has a similar odor, and a bitter very disagreeable taste, leaving upon the tongue an impression of acridity and producing salivation; it is, however, easily distinguished by its canary-yellow color, by its imparting a yellow color to the saliva, and by the fibrous layers of the interior portion preventing a smooth fracture." By the characters named this bark is readily distinguished from our Southern prickly ash. Its origin was first suggested by Virey in 1820 (*Jour. de Phar.*, vi, 88), who described it under the name of *cascanoqui*.

According to Grisebach (*loc cit.*) the species in question is known in the British West Indies as *prickly yellow wood*, and different species of Xanthoxylum and Tobinia (the latter now united with the former genus by Bentham and Hooker) are designated as *yellow wood*; also as *fustic* which name is, perhaps, more frequently given to the osage orange, Maclura aurantiaca, *Nuttall* (ord. Urticaceæ), and in Kentucky to Cladrastis tinctoria, *Rafinesque* (ord. Leguminosæ).

It follows from the above investigations that the West Indian Hercules club differs from our Southern prickly ash botanically as well, as also chemically, even if its acrid principle should ultimately be found to be identical with that of our southern indigenous

species. In this connection it may be of interest to note the medicinal properties of this bark, which according to Lindley (*Flora medica*) is much used in the West Indies in malignant ulcers, both internally and externally; an infusion is reckoned antispasmodic; tincture found by Dr. Gillespie, a West Indian practitioner, to be a good febrifuge; according to others the decoction is anti-syphilitic.

As at present constituted by Bentham and Hooker, the genus Xanthoxylum comprises about 110 species which are mostly found in tropical regions, four being indigenous to the United States, but only two confined to this territory. These two species are now recognized by the Pharmacopœia as *X. fraxineum* and *X. carolinianum*—names which appear to the writer to be more descriptive, and therefore preferable to the older names *X. americanum* and *X. Clava-Herculis*, of which particularly the latter has been the cause of much confusion.

Cytisus scoparius, *Link*, *broom*, is a shrub introduced from Europe, and in the new "Gray's Manual" is stated to grow in Virginia and southward. It is, however, completely established in and near Philadelphia, along the Philadelphia, Wilmington and Baltimore Railroad, where it grows quite profusely in some localities in sandy soil and sunny locations. The shrub deserves to receive some attention, as during its flowering period in May and June it has quite an attractive appearance owing to the numerous bright yellow flowers, which afford a pleasant relief to barren, and frequently bare hillsides The young branches have been admitted into the United States and British Pharmacopœias, though they are no longer thus distinguished by the Pharmacopœias of Continental Europe; they are, however, still popularly used there for their diuretic and purgative properties; and the flower buds have been used sometimes as a substitute for capers, and the roasted seeds in the place of coffee. The plant was placed by Linnæus in the genus *Spartium;* French and German botanists usually follow either Lamarck, who placed it in the genus *Genista*, or Koch (*Sarothamnus*), or Link (*Cytisus*). Bentham and Hooker have grouped about 40 species in the genus Cytisus, the plant in question belonging to the first section Sarothamnus.

Senega.—During the past year (Amer. Jour. Phar., Sept. 1889, p. 449–453) I have shown that the keelless or false senega root, which has been in the market during the past fourteen years,

is produced by Polygala alba, *Nuttall*. Since the present edition of Gray's Manual includes also the plants west of the Mississippi to Western Kansas, it gives a description of this plant as well as of the true senega plant, and it will, therefore, be of special interest to compare the botanical characteristics of the two, which are given as follows:

P. Senega, *Linné*.	P. Alba, *Nuttall*.
Stems several from thick and hard knotty rootstocks, simple (6 to 12 in. high);	Stems several from a hard rootstock 1 foot high;
Leaves lanceolate or oblong-lanceolate, with rough margins;	Leaves narrowly linear, 3–12 lines long, acute;
Wings (i. e., 2 inner sepals) round-obovate, concave;	Wings oblong-obovate;
Crest (of lower petal) short;	Crest small;
Caruncle (of seed) nearly as long as the seed.	Lobes of the caruncle half the length of the appressed-silky seed.
Habitat. Rocky soil, W. New England to Minn., and southward.	Nebraska and Kansas to Texas.

From the descriptions it will be observed that the close resemblance is not confined to the roots, but applies also to the over-ground organs of the plant.

Fennel "has become naturalized along the shores of Maryland and Virginia, and is a common escape." The name preferred for the plant is *Fœniculum officinale*, *Allioni*, while the present Pharmacopœia has F. vulgare, *Gaertner*.

Caraway, Carum Carui, *Linné*, is stated to be "naturalized in many places, especially northward."

Conium maculatum, *Linné*, appears to have spread considerably on this continent. Of late years I have received specimens of the plant from several localities in Pennsylvania and neighboring states, where it did not exist about twenty years ago. The present "Manual" states that the plant grows in waste places from New England to Pennsylvania, and west to Iowa and Minnesota.

Burdock is enumerated under the Linnæan name *Arctium Lappa*, replacing Lappa officinalis, *Allioni*, of the Pharmacopœia.

Dandelion is now Taraxacum officinale, *Weber*, in the place of T. Dens-leonis, *Desfontaines*, as at present recognized by the Pharmacopœia.

Lactucarium is not likely to be prepared in the United States on a large scale, as long as a sufficient supply is furnished from Europe at a moderate price. But it is of interest to note that one of the plants yielding it has considerably increased the number of its habitations on this continent; for, according to the "Manual," Lactuca Scariola, *Linné* extends in waste grounds and on roadsides, from the Atlantic States to Missouri and Minnesota. Since, a good medicinal lactucarium may also be prepared from our indigenous species, it should be noted that the plants regarded as mere varieties in the preceding edition of the Manual have been restored to the dignity of species; accordingly we have now L. canadensis, *Linné*, L. integrifolia, *Bigelow*, and L. hirsuta, *Muhlenberg*.

Sweet Fern is no longer Comptonia asplenifolia, *Aiton*, the genus having been united as a section or subgenus with *Myrica*; hence we have now Myrica asplenifolia, *Endlicher*.

Chestnut leaves are henceforth collected from *Castanea sativa*, *Miller*, var. americana, instead of from *C. vesca L.* The latter name appears to be more appropriate for our indigenous tree, which is rarely cultivated.

MARRUBIUM VULGARE.

By John W. Morrison, Ph.G.

Contribution from the Chemical Laboratory of the Philadelphia College of Pharmacy.—No. 75.

In order to determine the usual constituents of this plant, a portion was first subjected to a systematic course of proximate analysis, by the usual solvents, with the following result:

	Per Cent.
Fat, wax and traces of volatile oil,	2·05
Crystalline compound, soluble in ether,	·48
Chlorophyl and fat,	2·29
Resin and bitter compounds, soluble in absolute alcohol,	1·94
Mucilage,	4·94
Glucose,	·67
Extractive, soluble in water,	5·93
Albuminoids,	4·48
Pectin and undetermined,	5·93
Pararabin,	2·30
Cellulose and Lignin,	37·48
Moisture,	6·72
Ash,	24·30
Loss,	·49
	100·00

The fat was soluble in hot 95 per cent. alcohol, and melted at 46° C. The wax was insoluble in this solvent, but dissolved in carbon bisulphide. The crystalline principle was extracted from the drug with stronger ether, and purified by repeated crystallization from hot 95 per cent. alcohol, with one or more treatments with animal charcoal. The crystals were insoluble in water and in solution of potassium hydrate, very sparingly soluble in boiling water and in cold alcohol. Soluble in hot 95 per cent. alcohol, also in ether and chloroform. They melted at 152° to 153° C. They were at first tasteless, but developed, when held on the tongue, a decided bitterness. The alcoholic solution was very bitter.

Sulphuric or nitric acid gave a dark brown color, hydrochloric acid produced no change and ferric chloride produced no change.

This principle reduced Fehling's solution by a boiling water-bath, without first treating with an acid. On boiling it first with acidulated water a peculiar aromatic odor was developed, then on heating with Fehling's solution an abundant precipitate of cuprous oxide was produced, thus showing it to be an easily decomposed glucoside.

A small quantity of a bitter principle was extracted from the drug by absolute alcohol, along with the resin. This appeared to be different from the previous one extracted by ether, and for the purpose of further investigation, a larger quantity of the drug was exhausted with ether, the solvent recovered and the residue treated with petroleum ether to remove fat and wax. The remaining portion was dissolved in hot alcohol, treated with animal charcoal and crystallized. The crystals were purified by repeated crystallization and treatment with animal charcoal. Melting point, 152° to 153° C.

The average of two combustion was:

	Found.	Calculated for. ($C_{40}H_{58}O_9$.)
C,	70·25	70·38
H,	8·42	8·50
O,	21·33	21·12
	100·00	100·00

Three samples of crystals, presented with a thesis of last year by Frederick G. Hertel, Ph.G. (American Journal of Pharmacy, 1890, p. 273) and obtained by him from the fluid extract, were also examined. One of these, which he had crystallized from cold alcohol,

melted at 153·5° to 154·5° C. was evidently nearly pure, the average of three combustions gave :

C,	70·54
H,	9·08
O,	20·38
	100·00

The other samples were evidently the same compound in a more impure condition, as was found by combustion and melting point.

This compound as well as that obtained by myself is evidently the marrubiin discovered by Mein in 1855. Harm (Archiv der Pharmacie, No. 83, page 144) stated the melting point to be 148° C.

In a later communication the same author (No. 116, page 41) on elementary analysis found the substance contained 8·52 per cent. of hydrogen and " more than 69 per cent. of carbon."

Kromayer (Archiv der Pharmacie, No. 108, page 257) gives the yield of marrubiin as about 2 grams from 25 pounds of the drug, and states the melting point to be about 160° C., and that it is not a glucoside. My results indicate its composition to be very close to that of absinthiin $C_{40}H_{58}O_9$, but it does not agree with all the properties of that substance described by Kromayer in the same journal (No. 108, p. 120), who states that absinthiin melts at 120° to 125° C. Many of the properties, however, are common to both substances, prominent among which are, solubility, taste, gritty between the teeth, crystalline appearance and percentage composition.

The larger portion of the drug, after exhaustion with ether, was extracted with methyl alcohol, the solvent recovered and the residue treated with water and filtered.

The filtrate, on agitation, successively with ether and chloroform, yielded to the former a very bitter greenish substance with a narcotic odor, and to the latter, a brownish substance with a bitter and pungent taste. Both gave negative results when tested for alkaloids and both reduced Fehling's solution, especially after heating with dilute acid, during which process each developed a peculiar aromatic odor. These results point to the presence of two bitter principles besides marrubiin, which is in agreement with Hertel's statement that after the separation of marrubiin " the fluid extract appeared to be as bitter as before."

NOTES ON SOME NORTH AMERICAN MEDICINAL PLANTS.

By John M. Maisch.

Read before the Pennsylvania Pharmaceutical Association, at York, June 11.

Adulterated Staranise.—The *Répertoire de Pharmacie*, of April 10, contains the following statements:

"Mr. E. Barral announces in *Gazette hebdomadaire*, of November 29, 1889, a new dangerous falsification of staranise with the fruit of *Illicium parviflorum;* these fruits, he states, resemble those of the true staranise, and for several years have been met with in England and Germany. Mr. Barral has studied the effects of the decoction and of the extract of this fruit, and has proved that these preparations contain a toxic principle which produces in dogs vomiting, insensibility, paralysis of the posterior limbs, convulsions, and finally death. The poisonous principle resides principally in the seed, and is probably a glucoside differing from that met with in *I. religiosum.*"

The plant mentioned is a shrub indigenous to the southern districts of Georgia and to East Florida, and to some extent cultivated in Europe in botanical gardens. It is scarcely likely that the fruit be collected in Europe for the purpose of mixing it with staranise; and inquiries made by me in this country have thus far failed to find the fruit in commerce. Mr. E. M. Holmes called attention to this fruit in *Pharm. Jour. and Trans.*, December 18, 1880 (see Am. Jour. Phar, 1881, p. 335), described it as consisting of eight short-beaked capsules having a sassafras-like taste, and stated that it and the fruit of *Ill. floridanum* are not met with in commerce.

The two indigenous species have been looked upon with suspicion in their native localities, and the last named, which is found from Florida west to Louisiana and Mississippi is known sometimes as "poison bay." This species was histologically and chemically investigated by Henry C. C. Maisch (Am. Jour. Phar, 1885, pp. 225 and 278), who isolated from the leaves and the capsules crystals of a glucoside which probably represents the poisonous principle, and differs from the shikimin isolated by Eykman from the capsules of *Ill. religiosum.* The different parts of *I. parviflorum*, to which attention has again been drawn by Barral's communication, deserve to be fully investigated.

Hedeoma is the name of a genus of labiatous plants, comprising about fourteen species indigenous to North and South America.

The best known and most widely distributed species is *H. pulegioides*, which extends from New England to Dakota and southward, being met with in the southern states on dry hills. From the resemblance of its odor and taste to the European Mentha Pulegium, *Linné*, it is known throughout the country as *pennyroyal* or *American pennyroyal.* Most, if not all, the other species of Hedeoma have a different odor. H. piperita, *Bentham*, for instance, is peppermint-like, and according to the Mexican Pharmacopœia, is used like and in place of peppermint. Some of the North American species may, perhaps, be locally employed. This is the case with H. thymoides, *Gray*, which grows in Texas on high land and produces its pink and fragrant flowers in April. In Lavaca County, and possibly in other parts of Texas, the plant has the reputation of being diaphoretic and febrifuge, the infusion being employed. The taste of the plant is aromatic, citronella-like, and scarcely bitterish.

Colorado Cough root.—Under this name a root has been received on several occasions, which is said to be commonly used in some parts of Colorado. It is evidently derived from an umbelliferous plant, and having a lovage-like flavor, may possibly be the root of a Ligusticum, of which four species are known to be indigenous to the state named (Coulter, Rocky Mountain Botany, p. 117). But since a large number of species of other umbelliferous genera are likewise peculiar to this region, it is impossible to arrive at a reliable conclusion without botanical specimens. Such were promised, but have not yet been received. The root is masticated, and is also employed in the form of powder as a snuff said to be efficient in catarrh and neuralgic affections.

Peppertree is the popular name of an ornamental tree which is not indigenous to North America, but is cultivated to some extent in California. The leaves as well as the reddish drupaceous fruits, which are of the size of black pepper, have a strong peppery flavor; hence the popular name. The tree belongs to the order of Anacardiaceæ, and to a genus of about thirteen species, mostly of tropical America. Schinus Molle, *Linné*, grows from Mexico southward, and in the country named is known as *arbol del Peru*, indicating its South American origin. The bark, leaves, fruit, and the gum-resinous exudation are employed medicinally, the former as a balsamic astringent, the other products for their stimulating properties (see Amer. Jour. Phar., 1866, p. 503, and 1885, p. 340). When

the piperaceous taste is considered, and the fact that the fruit contains enough sugar to warrant its employment for the preparation of an alcoholic beverage and of vinegar, it is surprising that the different parts of the plant have not been subjected to analysis. The bark contains tannin; the gum resin contains about 60 per cent. of resin and a little volatile oil, and the fruit was supposed by Landerer (1862) to contain piperine, which supposition, however, does not appear to have been verified or disproved by later investigations.

MICROSCOPICAL EXAMINATION OF POWDERS.

By Hans M. Wilder.

II.

Reflected Light.—Although the examination of a powder is chiefly conducted by transmitted light, many valuable hints may be obtained by first examining the powder by reflected light; of course, with the dry powder against a dark background, and then when mixed with water (or other fluid) under a cover glass, similarly.

Specific Gravity.—It will in many cases (especially with compound powders) be of great help to be able to examine the several constituents of a powder separately, at any rate some of them. This can be attained by an elutriation process ("water sifting'" as Remington happily calls it). Fill a conical glass (graduate) three-fourths full of water, sprinkle on top of the water some of the powder to be examined, and allow the particles to settle undisturbed; the heaviest sink, of course, first. After a short time examine the particles floating on top, and those on the bottom separately. Several powders are a good deal heavier than water, when a strong solution of salt, or a heavier liquid should be used.

Sections.—A preliminary study of sections of the drug in question is of great assistance in recognizing the powder. Transverse sections are not of so much use as longitudinal ones (both radial and tangential) because the elements of the powder seldom will be seen "standing on end," as it were; they are chiefly seen from the flat side (surface view).

Heating.—A great help in clearing a mount, is to heat the slide until numerous small air-bubbles appear—until the medium just begins to boil, but not longer.

Mounting.—A mistake, beginners are very apt to make, is to put

sufficient powder on one slide to make six or more useful slides. The thinner the layer of powder, and, one might say, the less of it there is, the easier the mount can be examined.

Hard Oil Finish.—The writer would recommend a trial of hard oil finish (Berry Bros. "white") as a substitute for the smeary, sticky benzol balsam, it being much more agreeable to handle, and drying in a much shorter time. Its drawbacks are that it imparts a decidedly yellowish cast to the mount, and that the mounts are not so glassy-like as the pure balsam mounts.

Adulterations.—It is advisable to become familiar with the microscopical appearance (both dry, and in different media) of the following substances, which are most commonly met with as impurities and adulterations: Fibres, starches, wheat, rye, corn, rice and oat flour, ground cocoanut shells (not cacao), cedarwood ("segar-box wood"), mineral colors (chrome yellow, Venetian red, Spanish brown, oxide of iron), sand, charcoal, dried bread ("cracker dust").

OBSERVATIONS ON SOME FLUID EXTRACTS.

ABSTRACTS FROM THESES.

Extractum Buchu Fluidum.—Edward Moor, Jr., Ph.G., made a series of experiments with the view of determining the amount of soluble matter taken up from short buchu leaves, in No. 60 powder in different portions of percolate. 1,000 grams of the powder were used for each experiment. In Nos. 2 and 6 the ordinary percolator of rather large diameter was employed, while for the remaining four the narrow Oldberg's percolator was taken. The menstruum was that directed by the Pharmacopœia. In the two experiments made by the pharmacopœial process the first portion reserved measured 850 cc., and the weaker percolates were collected in fractions of 1,000 cc. Commencing in experiment No. 3 with repercolation, the first portion reserved measured 750 cc., and the weaker portions were again collected in fractions of 1,000 cc. For the remaining three percolations the weaker percolates of the preceding experiment were employed in the place of alcohol and water, and each of the five portions of percolate measured 1,000 cc. The first portions of the repercolation experiments correspond to the finished fluid extract. The amount of extractive matter taken up was determined by evaporating, in a water bath, 100 cc. of each fraction to nearly a pilular consistence. The finished fluid extract made by process

No. 1 was kept on hand for six months, when it had deposited a slight precipitate which, after being collected on a weighed filter, was found to amount to 1·25 gm. The results tabulated are as follows:

	U. S. P. PROCESS.		REPERCOLATION.			
Percolates.	No 1. Per Cent.	No. 2. Per Cent.	No. 3. Per Cent.	No. 4. Per Cent.	No. 5. Per Cent.	No. 6. Per Cent.
First portion, ...	20·75	18·10	21·40	22 80	22·20	18·60
Second portion, ...	5·50	6·25	6·30	5·90	5·70	6·05
Third portion, ...	1 95	2·60	2·10	2·15	2·15	2·20
Fourth portion, ...	·95	1·15	·85	1·30	1·20	1·25
Fifth portion, ...	·35	·65	·45	·50	·45	·70
Total extractive, . . .	29·50	28·75	31·10	32 75	31·70	28·80

Extractum Grindeliæ Fluidum.—Aiming at preparing this fluid extract so as to mix with water without precipitating, W. H. Kunkle, Ph.G, used first the pharmacopœial menstruum, alcohol 3 p., water 1 p.; secondly, diluted alcohol, and thirdly, diluted alcohol rendered alkaline by 5 gm. soda solution for 100 gm. of powdered grindelia. These preparations were precipitated by water. But the fluid extract remained clear on dilution, when prepared by exhausting the powder with water containing, for 100 gm. of powder, 2 gm. of borax; reserving the first 60 cc. of the percolate; evaporating the remainder to a soft extract; dissolving this in the reserved liquid; adding water to make 75 cc., and then mixing with 25 cc. of alcohol. A precipitate is produced which appears to consist mainly of borax and gummy matter, and after filtering, a handsome preparation was yielded which was miscible with water in all proportions without causing a precipitate. No observations are recorded as to the medicinal effects of this borated fluid extract; but reference is made to the suggestion of Dr. W. P. Gibbons who, for obtaining the therapeutic effects of grindelia, found the borated infusion more reliable than an alcoholic preparation.

Extractum Humuli Fluidum.—Peter N. Duff, Ph.G., prepared four fluid extracts, using in each case 16 oz of hops grown in New York State in 1889. The menstruums were 1, alcohol 8 p., water 1 p.; 2, alcohol 3 p., water 1 p.; 3, alcohol 2 p., water 1 p., and 4, diluted alcohol. The hop was used in No. 20 powder, and the fluid extracts prepared by percolation in the usual manner. On keeping the preparations for some time at a temperature of 50° to 60° F., No. 1

remained free from deposit; it has a dark reddish color and the full rich aroma of the hops. No. 2 showed a heavy deposit of extractive matter, while the deposits in Nos. 3 and 4 were less pronounced; but these three preparations seemed also to possess the full aroma of the hops.

Extractum Cubebæ Fluidum.—F. M. Schick, Ph.G., determined the amount of residue left from this fluid extract by evaporating one ounce of it in a tared capsule placed in a water-bath on a steam radiator. Two extracts prepared by himself left respectively 26 and 26·25 per cent., while fourteen samples procured in different cities gave the following yields: 16·67, 18·33, 20, 21·67, 23·33, 24, 24·16, 24·58, 25·21, 26·50, 27·33, 30·83, 31·25 and 31·67 per cent.

ABSTRACTS FROM THE FRENCH JOURNALS.

Translated for The American Journal of Pharmacy.

Granular Drugs.—M. P. Carles (*Repert. de Phar.*, May), says that these have a finer appearance than ordinary powdered drugs, and that they are easier to handle, and give clearer preparations when used for macerations or infusions. But he has found by chemical analysis that the granulated drugs are not so rich in alkaloids as are the ordinary powdered drugs, and that their lack of strength is, with a few exceptions, proportioned to the size of the granulated particles. His conclusions are presented as follows: "When, by means of a progressive division and the use of sieves we convert simple drugs into granular powders we disturb their pharmacodynamic harmony and modify their richness in extractive matters; and we do this always in the same way; that is, to the prejudice of the coarser powders and to the advantage of those which are the most finely divided."

Chloral-Antipyrine.—At a recent meeting of the *Société de Pharmacie*, M. Béhal showed samples of monochloral-antipyrine and bichloral-antipyrine. The first was displayed in the form of large crystals in the Exposition of 1889. It seems probable that, under these names, the above preparations are to receive careful clinical tests from French physicians.

Physiological Action of Ferrocyanide of Potassium.—MM. Combemale and Dubiquet have reported to the *Société de Biologie* the results of their experiments with this drug on dogs and guinea pigs. They found that in doses of 2 gm. per kilogramme of the

animal, the ferrocyanide of potassium had no toxic effect, and no influence upon respiration, circulation, temperature, or the nervous system. In dogs the continued use of the drug caused intestinal disturbances. In doses of 80 cgm. per kilogramme it gave rise to vomiting. Light doses caused diuresis in the smaller animals.

Tannicated Syrup of Iodine.—For this, *L'Officine* gives the formula of: Iodine, 2 gm.; ext. krameria, 8 gm.; simple syrup, q. s. to make 1 kilogramme. M. Demandre (*Bull. de la Soc. des Phar. de la Côte d'Or*), proposes a shorter method than that of the Codex, and one in which the iodine "enters into integral combination with the tannin without loss." He dissolves iodine, 2 gm., in alcohol, 24 gm., and mixes this tincture with a solution of ext. krameria, 8 gm., in chemically pure glycerin, 16 gm., adding, finally, 950 gm. of simple syrup. This he heats slowly in a water-bath for two hours to a temperature of 149° to 158° F. "The syrup thus obtained," says the author, "may be diluted with pure water, or with starch-water, without giving any reaction; it has a fine red color, is limpid and keeps well." *Répert. de Phar.*, June 10.

Distilled Water in Metallic Containers.—M. Kauffeisen, of Dijon, made a preparation of orange-flower water, 50 gm.; syrup of codeine, 15 gm.; and tr. digitalis, 10 drops. On the next day he found the mixture almost as dark as though it had consisted chiefly of digitalis. He found that the distilled water used by him had been brought to the pharmacy in an iron vessel. The water had not remained long in the receptacle but the pharmacist found it to contain nearly 1 cgm. of iron to the litre. When the water is known to contain iron, the author thinks this may be removed by stirring in a small quantity of carbonate of magnesia and filtering.—*Bull. de la Soc. des Phar. de la Côte d'Or.*

Reaction of Saliva upon Calomel in Iodoform Poisoning.—M. Burlureaux observed a scarlatinaform eruption in a patient whose arm had been treated topically with iodoform. The patient was asked to take a piece of silver into his mouth, and soon perceived the alliaceous taste characteristic in such cases. A small quantity of the patient's saliva was then treated with calomel. It gave the greenish-yellow reaction of protiodide of mercury.

Calomel Plaster.—As used by Dr. Quinquaud in the treatment of syphilis, this consists of: Calomel, 10 parts; diachylon plaster, 30 parts; castor oil, 3 parts. The ointment is spread upon muslin cut

into pieces four inches square. These are applied over the splenic region for eight days at a time, allowing intervals of eight days between the applications. The plasters should be renewed every four days. The author says: "With a plaster of this size there is usually no salivation; with one of double the size we get a slight salivation with a benign stomatitis." It is stated that the author administers mercury for syphilis in no other form.—*Soc. Franc. de Derm. et de Syph*, Apr. 12.

The Toxalbumins.—According to Professor Cornil the toxic action of pathogenetic microbes is not wholly due either to the microbes themselves or the alkaloids they secrete. Christmas has found that cultures of staphylococcus pyogenes aureus contain a pyogenic albuminous substance which may be precipitated by alcohol. Hankin precipitated this toxic albumin from cultures of charbon bacilli by the use of ammonia sulphate and alcohol, and found them to possess innoculatory power. Brieger and Frænkel and Roux and Yersin obtained the substance from cultures of the diphtheritic bacillus. It is soluble in water and may be precipitated by carbonic, acetic and some of the concentrated mineral acids, by phenol, sulphate of copper, nitrate of silver, chloride of mercury, the usual reagents for albumin, and the xanthoproteic reagent, while polarization also shows that it is a derivative of albumin. The substance is said to resemble sero-albumin. It is very toxic and conserves its properties after being subjected to a heat of 158° F. Brieger and Frænkel think that the toxalbumins "arise in the organism and develop there at the expense of the albumin of the tissues.—*Jour. de conn. méd.*, May 1.

Dentifrices.—The formulæ of M. P. Vigier's antiseptic dentifrices are given in the *Gazette hebdomadaire* as follows: Powder—Resorcin, 2 gm.; salol, 4 gm.; iris (pulv.), 40 gm.; carbonate of lime, 8 gm.; carmine No. 40, 30 cmg. Ten drops of ol. menth. pip. may be added if thought necessary, but the author considers the odor of the salol as quite sufficient. Elixir—Any elixir dentifrice, 100 gm.; resorcin, 2 gm.; salol, 2 gm.

Milk of Lime as a Disinfectant for Walls Exposed to the Germs of Disease.—Experiments made by Dr. Giaxa, of the University of Pisa, seem to show that the bacilli of typhoid fever and of cholera are destroyed by this application, which, for the former should contain 50, and for the latter, 20 per cent. of lime.

Milk of lime will also destroy the bacillus of charbon, but not its spores. The bacillus of tetanus and of tuberculosis are not affected by lime, and, in these cases, corrosive sublimate should be used. To destroy the staphylococcus pyogenes aureus, a prolonged action of the lime preparation is necessary; 50 per cent. applications should be made upon the walls four times in quick succession in order to insure a complete destruction of the germs.—*Ann. de microg.; Répert. de Phar.*, May.

CHEMICAL NOTES.

By Henry C. C. Maisch, Ph.G., Ph.D.

On Panax Ginseng.—Davydow (*Pharm. Zeitschr. f. Russl.*, 1890, p. 97, 113, 130) has taken up the analysis of this root made by Garrigues (Am. Jour. Pharm., 1854, p. 511). For panaquilon he uses the following process: The finely powdered root is repeatedly extracted with cold water until the same shows no acid reaction. The several aqueous extracts were united and treated with animal charcoal, filtered and evaporated to dryness. The residue is dissolved in boiling 95 per cent. alcohol, filtered, and the alcohol recovered. Panaquilon remains as an amorphous, light yellow mass, easily soluble in alcohol and water, insoluble in ether, and does not contain nitrogen. Concentrated sulphuric acid gives a blood-red color, gradually turning to a reddish violet. Panaquilon is neither an alkaloid nor a glucoside. On boiling with dilute sulphuric acid a crystalline powder, panacon, separates, which is insoluble in water and ether, but soluble in alcohol. Concentrated sulphuric acid dissolves and colors it purplish red. Concentrated nitric acid oxidizes it to oxalic acid. Garrigues gives the following formulæ: Panaquilon $C_{24}H_{25}O_{18}$, panacon $C_{22}H_{19}O_8$ (O=8).

Chemical Constituents of Quassia amara, L., and Picræna excelsa, Lindl.—F. Massute (*Lieb. Ann.*, ccxxviii, 147–141) isolated the bitter principles quassiin and picrasmin, and found that they are mixtures, the constituents being separated by fractional crystallization. Quassiin contains the following: $C_{32}H_{40}O_{10}$ (Wiggers) ($C_{32}H_{44}O_{10}$ Oliveri and Denaro) melting at 210°–211° C. $C_{32}H_{40}O_{10}(CH_2)_3$, m. p. 215°–217° C.; $C_{32}H_{40}O_{10}(CH_2)_5$ m. p. 221°–226°, and a new body, not analyzed m. p. 239°–242° C. By heating quassiin with hydrochloric acid, Oliveri and Denaro obtained quassiinic acid,

which has the composition $C_{30} H_{38} O_{10}$. Picrasmin contains $C_{29} H_{34} O_{10}$ m. p. 212°–216° C.; $C_{29} H_{34} O_{10} (C H_2)_6$ m. p. 204–205, $C_{29} H_{34} O_{10} (C H_2)_7$ m. P. 209°–212° C., and two bodies melting at 231–234 and 239–247° C. respectively. Picrasmin m. p. 204°–205° treated, like quassiin yields picrasmic acid $C_{33} H_{42} O_{10} + 5 H_2O$. Distillation with soda-lime yields fluorescent hydrocarbons very likely of the anthracene group. From this it is evident that the two bitter principles are not identical as has been supposed. Besides these bitter principles both woods seem to contain also small quantities of an alkaloid. A body from Q. amara, which dissolves in acidulated alcohol with an ultramarine blue fluorescence and crystallizes in yellowish prisms, seems to be an alkaloid.

Ephedrine and Isoephedrine.—Dr. N. Nagai (*Tokio Chem. Society*, through *Chem. Zeit.*, 1890, p. 441) obtained the alkaloid ephedrine from the stem of *Ephedra vulgaris* (ma-oh). The composition is $C_{10}H_{15}NO$; by oxidation the alkaloid is split into benzoic acid, monomethylamine and oxalic acid. Isoephedrine m. p. 114° C., is obtained by heating ephedrine m. p. 30° C., with hydrochloric acid in a closed tube to 180° C. The constitution of ephedrine is $C_6 H_5 CH_2 CH (N H C H_3) CH_2 OH$, and that of isoephedrine is $C_6 H_5 CH_2 C (OH) (NH CH_3) C H_3$.

On Lobeline.—H. Paschkis and A. Smita (*Akademie d. Wissen., Wien*, April 17, 1890, through *Chem. Zeit.*, 1890, 594) use the following method for preparing lobeline: The herb of Lobelia inflata is extracted with water acidified with acetic acid, the extract partly evaporated, made alkaline and extracted with ether. An extract was taken up with water and being acid was made alkaline and shaken with ether. The ether was evaporated and the alkaloid obtained as a thick oil of a yellow color. For purifying, the alkaloid was dissolved in ether, shaken with water acidulated with hydrochloric acid, then made alkaline and taken up with ether. This was repeated three times, the ethereal solution then dried with potassium hydrate, and the ether distilled in an atmosphere of hydrogen. The free alkaloid or the sulphate was suspended in 10 per cent. potassium hydrate solution and treated with 4 per cent. potassium permanganate, until the green color disappeared only slowly. The mixture was then filtered, acidified with sulphuric acid, extracted with ether, this evaporated and residue recrystallized from water. This proved to be benzoic acid.

On Damascenine, an Alkaloid from Nigella damascena L. Dr. A. Schneider (*Pharm. Centralh.*, 1890, p. 174 and 191) has isolated the fluorescent principle from the seeds of the above plant and shows it to be an alkaloid present to the amount of 0 1 per cent., and localized in the testa. The crushed seeds were macerated with benzin and expressed, this being repeated a number of times. This solution was then treated three times with dilute hydrochloric acid (1 pt. H Cl Ph. Germ., 3 pts. H_2O) filtered and made alkaline with sodium carbonate solution. In the first portion this caused a precipitate, the remaining portions as well as the filtrate from the first were extracted with chloroform. This solution was extracted with acid of the above strength and the alkaloid precipitated with solution of sodium carbonate. The precipitate which, however, was not solid but consisted of small oily drops was dissolved in absolute alcohol, and this solvent evaporated over sulphuric acid in a vacuum desiccator. The oil obtained was crystallized in a freezing mixture, and the cold solid pressed between bibulous paper. Thus prepared, the alkaloid melts at 27° C., and boils at 168° C., although it is volatile at ordinary temperature. The sp. gr. of the melted damascenine is 1·01. The alkaloid is insoluble in cold water and slightly so in hot, easily in ethyl and methyl alcohols, chloroform, methyiodide, carbon bisulphide, benzin, petroleum ether, benzol, fatty oils and paraffine. All solutions of the free alkaloid show blue fluorescence. Precipitates, consisting of minute oily drops, are formed with ammonia, sodium hydrate and carbonate, corrosive sublimate (all white), iodopotassium iodide (brownish-purple, gradually crystallizing), potassio-mercuric iodide (Mayer's reagent white crystallizing on rubbing), potassio-cadmic iodide and phosphomolybdic acid (both white, gradually turning yellow), potassio-bismuthic iodide (brown, gradually crystallizing), Nessler's reagent (grayish-brown), platinum, palladium and gold chlorides (crystalline, the Au salt soon blackens by reduction), picric acid and potassium bichromate (yellow, crystalline). The characteristic color reaction is obtained by melting the nitrate which turns blue. A solution of a salt with sulphuric acid and potassium bichromate turns blood red or violet red. Solutions of the alkaloid containing an excess of nitric acid soon turn violet red, which color is soluble in alcohol, chloroform and acetic acid, and has almost the same color as methyl violet. The chloride melts at 121° C., the nitrate at 98° C. (at 180° C. blue, at 210°

C. brown, with a quinoline odor), the sulphate at 160°–170° C., and the platinum double salt at 165° C. A combustion makes the composition $C_{10}H_{15}NO_3$ probable.

Cinnamon oils. Holmes (*Pharm. Jour. and Trans.*, 1890, 749) compares the oils obtained from the leaves and from the bark of trunk and branches. The oil from the leaves contains: eugenol, a hydrocarbon with a cymene-like odor, little benzoic acid and a still smaller quantity of cinnamic aldehyde, while the oil from the bark consists principally of cinnamic aldehyde.

On Peucedanin and Ostruthin. According to A. Jassoy (*Apoth. Zeit.*, v, 150) peucedanin the bitter principle of *Peucedanum officinale* has the composition $C_{15}H_{14}O_4$, and is the methyl ether of *oreoselon* $C_{14}H_{11}O_3OH$, a phenol-like body. By the action of bromine on peucedanin and oreoselon a monobromoreoselon is obtained; nitric acid acting on either gives mononitrooreoselon and styphninic acid. Acid anhydrides do not act on peucedanin, acid chlorides split off methyl chloride and form acid ethers. P. officinale contains another bitter principle, *oxypeucedanin* (Erdmann) in smaller quantity however. *Ostruthin* the bitter principle of *Imperatoria Ostruthium* has the formula $C_{18}H_{20}O_3$. It does not contain a methoxyl group but a phenol-like hydroxyl. The ethers can be made with the acid anhydrides while the chloride decompose the ostruthin. Peucedanin is not present in the latter rhizome at any time.

GLEANINGS FROM THE GERMAN JOURNALS.

By Frank X. Moerk, Ph.G.

The detection of stearic acid in wax may be easily and certainly made by boiling in a test tube one gram of the sample with 10 cc. alcohol of 80 per cent. for a few minutes, allowing to cool to 18°–20° C., filtering into another test tube, diluting with water and agitating thoroughly; if as little as 1 per cent. stearic acid was present an immediate flocculent precipitate will be obtained, which collects on the surface of the clear liquid. The test depends upon the insolubility of wax constituents in 80 per cent. alcohol, while sufficient stearic acid is dissolved to yield a precipitate upon dilution. —Dr. H. Röttger, *Chemiker Ztg.*, 1890, 606.

Mercurial Ointment.—To secure a rapid extinguishing of the mercury, numerous additions have been recommended with more or

less success; the latest suggestion in this line is to place the mercury and lard in a mortar and to add, from time to time, a small quantity of the suet and triturating until the fats make a homogeneous mass before adding more. By this simple procedure a smooth ointment is obtainable with a decided saving of time.—L. M., *Pharm. Ztg.*, 1890, 354.

Mineral constituents of ground spices and condiments.—The Bavarian Representatives of Applied Chemistry, at their ninth annual meeting, held in Erlangen, in last May, adopted the following figures as *maximum* ash percentages and ash insoluble in HCl; both of the figures have reference to the air-dried article: Black pepper, 6·5 per cent. and 2 per cent.; white pepper, 3·5 per cent. and 1 per cent.; cinnamon, 5 per cent. and 1 per cent.; cloves, 7 per cent. and 1 per cent.; allspice, 6 per cent. and 0·5 per cent.; mace, 2·5 per cent. and 0·5 per cent.; nutmeg, 5 per cent. and 0·5 per cent.; saffron, 8 per cent. and 0·5 per cent.; ginger, 8 per cent. and 3 per cent.; caraway, 8·5 per cent. and 2 per cent.; fennel, 10 per cent. and 2 per cent.; anise, 10 per cent. and 2 per cent.; marjoram, 10 per cent. and 2 per cent.; paprica, 5 per cent. and 2 per cent.; cardamom, 10 per cent. and 2 per cent.—*Chemiker Ztg.*, 1890, 687.

Tannin reaction.—If a tannin solution be boiled for some time with phenylhydrazin and then solution of sodium hydrate carefully added, there will be obtained a beautiful green-blue solution changing to yellow; as neither gallic nor pyrogallic acid give the same test, the reaction is characteristic for tannin, and will serve to detect traces of it. The tannin derivative giving this reaction with sodium hydrate was isolated and gave the hydrazin reaction with concentrated sulphuric acid and ferric chloride. The same body could be obtained from sumach extract, but not from oak-bark extract nor oak-bark infusion.—C. Böttinger (*Liebig's Ann. Chem.*) *Chem. Rpt.*, 1890, 152.

Lysol is the name given to a new disinfectant, introduced by Dr. Gerlach, of Wiesbaden, made by boiling for several hours in a flask with invert condenser, proper quantities of an alkali and any fat, fat acid, resin or resin acid with tar oils; after cooling, a mass results which is soluble in water in all proportions. To the aqueous solution may be added desirable quantities of the higher phenols. This preparation is claimed to be superior to carbolic acid, creolin and sulphocarbolic acid in killing bacteria, and is only slightly poison-

ous; it does not irritate wounds; in ½ per cent. solution it produces on mucous membranes slight burning, which quickly disappears, in 0·3 per cent. solution it will answer as a surgical antiseptic, and in 3 per cent. solution has the properties of a soap, and is used as a disinfectant for the hands.—*Pharm. Post*, 1890, 426.

Acetanilide.—The melting point of this important chemical is given in such a wide range (112–123°) that considerable variability of the commercial product is indicated. Knowing the almost constant presence of toluidine in aniline, and remembering that the former responds to the reagents used in making acetanilide as easily as does aniline, the variations in the melting point of acetanilide may be caused by the presence of acettoluides, which have the following melting points: *Ortho*, 107°; *meta*, 65·5°, and *para*, 147° C. A very important reaction, which enables one to detect acettoluide in acetanilide, is in the use of a boiling solution of potassium permanganate; acetanilide, if pure, is not altered, and does not reduce the permanganate, while acettoluide is oxidized to acetamido benzoic acid with reduction of the permanganate; of a number of samples of acetanilide examined, only one showed a slight reduction, all the others a decided reduction. A sample of commercial acetanilide (m. p. 112° C) after boiling with permanganate until a permanent red color was obtained, filtering, allowing to cool, and repeatedly re-crystallizing gave a product melting at 114° C.; no matter how often recrystallized, the crystals melted at 114° C. if the preparation was first completely dried at 105° C. The acetamido benzoic acid was obtainable from the filtrate of the first acetanilide crystallization by concentrating and adding hydrochloric acid. In addition to the tests for acetanilide given in Am. Jour. Pharm., 1889, 506, there may be required a melting point at 114° C. (after two hours' drying at 105° C.); only a slight reduction of permanganate (1 gm. acetanilide dissolved in 30 gm. boiling water should, after adding one drop of a 0 1 per cent. permanganate solution, retain a red color for at least five minutes, and, upon further boiling, should not produce a yellow color or precipitate); and ignition upon platinum without leaving a residue.—E. Ritsert, *Pharm. Ztg.*, 1890, 306.

Solubility of santonin in castor oil.—L. Reuter having occasion to dispense a prescription containing santonin and castor oil found that castor oil warmed on a water-bath would dissolve 4 per cent. of its weight of santonin of which the greater part crystallized out again

on cooling. A one per cent. solution, however, made by the aid of heat remained perfectly clear when kept for several days. This is the maximum quantity which will remain in solution.—*Apotheker Ztg.*, 1890, 246

Arsenic test.—The behavior of the hypophosphites towards arsenical solutions (precipitation of metallic arsenic) is brought into prominence again by G. Looff as a test for arsenic; in sensitiveness it ranks between the tests of Gutzeit and Bettendorf. Ten cc. hydrochloric acid, of any strength or purity, with 0.2 gm. calcium hypophosphite placed in a water-bath for 1–2 hours will enable the detection of $\frac{1}{100}$ milligram arsenic (Bettendorf's test will detect $\frac{1}{50}$ milligram). Five cc. sulphuric acid, phosphoric acid or glycerin with 0·2 gm. of a hypophosphite (in the presence of sulphuric acid the sodium salt is best used, in other cases the calcium salt because of its non-hygroscopic character) and 10 cc. concentrated hydrochloric acid warmed in a water-bath for 1–2 hours will show the presence of $\frac{1}{50}$ milligram arsenic. Of calcium phosphate, sodium phosphate and tartar emetic 0·5 gm. is dissolved in 10 cc. concentrated HCl and 0·2 gm. calcium hypophosphite added, etc. Bismuth subnitrate must first be ignited to remove the nitric acid, and then proceeded with as above; or dissolve equal weights of the subnitrate and hypophosphite in hydrochloric acid and warm. Sulphide of antimony is dissolved in HCl with the aid of a little potassium chlorate before adding the hypophosphite and warming. To test solution of ferric chloride a combination of Bettendorf's test and the hypophosphite test allows the detection of the smallest trace of arsenic: 5 cc. of the solution mixed with 10 cc. HCl are decolorized by addition of Bettendorf's test solution, then the hypophosphite added and warmed. Most of the commercial solutions of ferric chloride were found to contain arsenic.—*Apotheker Ztg.*, 1890, 263.

A morphiometric assay of opium for which is claimed purity of the morphine obtained, the alkaloid being almost white and immediately soluble in 100 parts lime water, considerable saving of time, and, constant results, the extreme differences of a number of assays being within 0·3 per cent. (the results of this method are always about 1 per cent. lower than by Dieterich s method) is as follows: 5 grams of the finely powdered opium are triturated with water and made up to 78 gm.; after frequently agitating during 1–2 hours, 60·8 gm. (representing 4 grams opium) are filtered off and in it dis-

solved 0·2 gm. oxalic acid. After one-half hour 5·2 gm. of a solution of potassium carbonate (1 : 2) are added, thoroughly mixed (avoiding unnecessary agitation) and 16·5 gm. filtered at once through a dry plaited filter of 12 cm. diameter into a tared flask of 30 cc. capacity. To the 16·5 gm. filtrate (representing 1 gm. opium) add 5 grams ether free from alcohol, cork the flask and agitate briskly for 10 minutes; the ether is then evaporated by use of a small rubber blast, the morphine collected on a small plain filter and thoroughly washed with water saturated with ether, dried at 40–50° C., returned to the flask which has been dried in the meantime and weighed to constant weight.

The addition of the oxalic acid is made to precipitate calcium salts which are present in all opium varieties excepting Salonica opium which gives no perceptible precipitate; by the use of a large excess of potassium carbonate the narcotine is completely and immediately precipitated while no morphine is precipitated in the minute's time necessary to filter off the 16·5 gm. filtrate.

This method has also been applied to the examination of *extract* and *tincture of opium*. 2·5 gm. *extract* are dissolved in water with the addition of 0·2 gm. oxalic acid, diluted to 70 gm., 5 gm. solution of potassium carbonate added, 15 gm. filtered off (corresponding to 0·5 gm. extract), etc., as above.

Fifty gm., with 0 2 gm. oxalic acid, are evaporated to a thin extract and gradually diluted with water to make 70 gm.; to this add 5 gm. solution of potassium carbonate and filter off 15 gm. (corresponding to 10 gm. tincture) and proceed as above.—G. Looff, *Apotheker Ztg.*, 1890, 271.

Cooling ointments are defined by Unna as mixtures of fat and water which, applied to the skin, produce a sensation of cold, owing to the evaporation of the water. They are to be preferred to the usual fat ointments which prevent the normal water-evaporation and which are often of injurious action. Lanolin, owing to its ready miscibility with water and aqueous solutions, was thought to be the best base for such ointments, but experiment did not confirm this; its effect is cooling at first, but this quickly disappears and gives way to a sensation of warmth. It was found that mixtures of lanolin and fats mix with large quantities of water and these mixtures had a permanent cooling effect. The proportions of *anhydrous* lanolin : fat : water are 10 : 20 : 30 for cooling ointments. Lanolin-

fat-ointments, with a maximum amount of water, are called *cream ointments*, owing to their appearance. *Ungt. refrigerans:* Anhydrous lanolin, 10; benzoinated lard, 20; rose water, 30. Uses: Same as cold cream. *Ungt. refrigerans aquæ calcis:* Anhydrous lanolin, 10; benzoinated lard, 20; lime water, 30. Uses: In burns. *Ungt. refrigerans plumbi subacetici:* Anhydrous lanolin, 10; benzoinated lard, 20; solution of subacetate of lead, 30. Uses: Same as Goulard's cerate. *Ungt. refrigerans zinci:* Anhydrous lanolin, 10; benzoinated zinc ointment, 20; rose water, 30. Used in place of zinc ointment. *Ungt. refrigerans ichthyoli:* Anhydrous lanolin, 10; benzoinated lard, 20; distilled water, 24; ichthyol, 6.

Cremor refrigerans, *Cremor refrigerans aquæ calcis* and *Cremor refrigerans plumbi subacetici* differ from the corresponding *ointments* in containing 60 parts of the aqueous liquid instead of 30 parts. It is recommended to prepare all of these ointments extemporaneously. —(*Therap. Monatsh.*) *Pharm. Centralhalle*, 1890, 303.

Myrrh.—A chemical examination of myrrh proved it to contain gum, resin and volatile oil. That portion soluble in water, but insoluble in alcohol, was found to be a gum of the carbo-hydrate formula $C_6H_{10}O_5$. The portion soluble in alcohol is a mixture of several resins, the greater part of which is an *indifferent* soft resin, soluble in alcohol and ether, of the formula $C_{26}H_{34}O_5$, containing three replaceable hydroxyl groups; there are also soluble in alcohol two dibasic acids of the formulas $C_{13}H_{16}O_8$ and $C_{26}H_{32}O_9$. The volatile oil is present in larger quantity (7–8 per cent.) than has been previously found (2·18 per cent.), by far the greater part consists of a body of the formula $C_{10}H_{14}O$ isomeric with thymol and carvol, but apparently a different substance. The formulas for the part soluble in alcohol show a certain relationship. If the formula $C_{13}H_{16}O_8$ be doubled there will result the three formulas $C_{26}H_{34}O_5$, $C_{26}H_{32}O_9$ and $C_{26}H_{32}O_{16}$, showing that the differences in the resins are due to different stages of oxidation. The essential oil, upon exposure, will assume the consistence and other appearances of myrrh.—Dr. O. Köhler, *Arch. der Pharm.*, 1890, 291–313.

Manganese preparations have recently been tried again in the treatment of chlorosis and excellent results were obtained especially with a peptonate. E. Dieterich, in *Pharm. Centralhalle*, 1890, 327–333, publishes the results of his efforts in making the so-called "indifferent manganese preparations," from which the following are taken:

Liquor Ferro-mangani peptonati.—10·0 citric acid are dissolved in 50 cc. distilled water and neutralized with ammonia water (about 20 0 are necessary). 24 0 liq. ferri peptonati (see Am. Jour. Pharm., 1888, 514) are carefully boiled with 150·0 distilled water until dissolved, the ammonium citrate solution added and also a solution of 3·7 pure crystallized manganous chloride in 10·0 distilled water; the following mixture is next added: 500·0 distilled water, 100·0 cognac, 0·75 each of tinctures of Ceylon cinnamon and vanilla, 1·5 aromatic tincture and 2 drops acetic ether; finally sufficient water to make 1000·0. The above directions must be strictly followed and then will furnish a preparation containing 0·6 per cent. iron and 0·1 per cent. manganese.

Manganese saccharate, M. mannitate and M. dextrinate.—75·0 pure permanganate of potassium are dissolved by the aid of heat in 4500·0 distilled water and allowed to cool; with stirring 45·0 white sugar or 45·0 alcohol are added and set aside for 24 hours. The precipitate is washed, by decantation, with distilled water until the washings leave no residue upon evaporation; it is then collected upon a cloth strainer and expressed until it weighs 300·0. The moist precipitate is next triturated with 900·0 sugar, mannite or dextrin, as the case may be, 225·0 solution of sodium hydrate added and warmed in a closed vessel in a steam-bath until a drop taken out dissolves perfectly in water; it is then evaporated to dryness and powdered.

The preparations contain 3 per cent. manganese; by taking only 225·0 sugar, mannite or dextrin instead of 900·0 preparations containing 10 per cent. manganese can be made. These preparations are easily soluble in water; concentrated solutions are permanent, dilute solutions of the saccharate precipitate after a time, but of the other two are permanent. The solutions can be acidified with *citric acid* without precipitation.

"Eucalyptus rostrata in sea-sickness."—Dr. Russell (*British Medical Journal*, February 22, 1890) finds the eucalyptus rostrata "red gum" more effective in checking sea-sickness than any of the other remedies hitherto recommended. He finds lozenges, each containing one grain of the eucalyptus gum, the most convenient form of administration, one being taken when sickness is coming on.

Action of Hydracetin.—Oestreicher has found this remedy (*Berl. klin. Woch.*) of some slight service in psoriasis, but apt to give rise to so alarming symptoms of poisoning that it cannot be commended.—*N. Y. Med. Jour.*, April 5, 1890.

DETERMINATION OF LUPULIN IN HOPS.[1]

By F. Reinitzer.

A portion of the hops (not weighed) is sifted by Haberlandt's process, and any grains which pass through the sieve removed with forceps. The lupulin is then weighed, shaken, and washed with chloroform into a dry filter, in which it is then wrapped and extracted with chloroform for about an hour. When dry, it is removed from the filter-paper to the weighing glass previously used, and weighed. The amount of lupulin husks is thus determined, and that of the lupulin found by subtracting this amount from the original weight.

A second weighed portion of the hops is then extracted with chloroform in a Soxhlet's apparatus, shaken on a sieve, the pieces of leaf removed with forceps, and the lupulin brushed through. The sifted portion is again sifted to obtain it free from grains. The pure lupulin husks are now weighed, and from the numbers, with the help of those previously obtained, the original weight of lupulin is calculated. The method gives much more concordant results than that originally employed by Haberlandt, and gives a better insight into the composition of hops than was previously possible. Examples of analyses are given which support this statement.

CAFFEINE TRI-IODIDE.

By P. W. Squire.

As paragraphs relating to this compound have appeared in the "Commentary" of *The Chemist and Druggist*, February 15 and May 3, and as some uncertainty seems to exist regarding the constitution of the body prescribed under this name, the following notes may be of interest.

For the confusion of formulæ which has arisen in connection with the subject, the original paper by Professor Tilden (*Jour. Chem. Soc.*, 1865, page 99) is primarily responsible. After reading that "the results of experiments undoubtedly point to the formula $2(C_8H_{10}N_4O_2I_3)3H_2O$," one does not naturally expect to find the author, after further experiment, altering the formula on the succeeding page to $2(C_8H_{10}N_4O_2.HI.I_2)3H_2O$, a change which gives a totally different idea of its constitution and method of preparation. Misled by the

[1] *Bied. Centr.*, xviii, 859. Reprinted from *Jour. Chem. Soc.*, April, p. 431.

want of visible connection between the two statements, *The Chemist and Druggist* commentator of May 3 gave Tilden's corrected formula as belonging to a closely-related but different compound to that denoted by the provisional and incorrect formula given on the previous page; and the printing of the latter in the paragraph of February 15 (copied into the *Pharmaceutische Zeitung*) has given an opportunity to Dr. Scholvien to add to the confusion by proving at considerable length that no body with such a formula could possibly exist.

When I was first asked by Dr. Mortimer Granville to prepare a quantity of the salt, Tilden's second formula was overlooked altogether, and his original directions were implicitly followed; but it soon became evident that the rapidity with which the crystals formed was directly proportional to the liberation of iodine from the excess of hydriodic acid present, an old and decomposed acid being far better for the purpose than a freshly-prepared and colorless acid.

The next experiment was to use an acid containing a quantity of added iodine, when a crop of crystals was quickly obtained, more than double the weight of the added iodine, the resulting inference being that two-thirds of the total iodine was practically in the "free" state, and the compound, instead of being a tri-iodide, was really (as indicated by Tilden) the normal hydriodide (hydriodate) of caffeine, with two loosely-combined atoms of iodine, whence its usefulness in therapeutics. Analytical results obtained by my assistant, Mr. Robert Thomson, completely confirm this view, and corroborate those obtained by Professor Tilden, except in regard to the water of crystallization, which we think in no case exceeds $1H_2O$ in the molecular compound.

The following are the percentage results obtained from some well-formed crystals:

	Experiment.	$C_8H_{10}N_4O_2.HI.I_2.H_2O$
Caffeine (anhydrous),	32·4	32·66
Hydriodic acid,	21·59	21·55
Iodine,	42·67	42·76
Water,	3·1	3·03
	99·76	100·00
Total iodine,	64·09	64·14

The constitution of the body may be shown by either of the three following methods: (1) By treatment with cold water iodine is liberated to the extent of 42 per cent. (two-thirds of the whole),

and may be titrated by hyposulphite. (2) By treatment with caustic soda, five-sixths of the "free" iodine is converted into iodide, and one-sixth into iodate of sodium; so that of the total iodine, eight-ninths (57·28 per cent.) is precipitated by silver nitrate from a solution containing excess of ammonia (in which silver iodate is soluble), and the remaining ninth (7·13 per cent.) on the addition of sulphurous acid, the theoretical percentages being 57·02 and 7·12, respectively. (3) By treatment with water and carbon bisulphide, or by boiling with water alone, the loosely combined iodine may be removed, and on evaporation the colorless liquid yields crystals of the ordinary hydriodide.

A complete synthesis of the salt has been effected by dissolving the theoretical quantities of caffeine and free iodine in hot hydriodic acid, previously saturated in the cold with the "tri-iodide," when the theoretical quantity of this di-iodo-hydriodide crystallized out on cooling.

As the still more highly iodized compounds of caffeine present many features of interest, both chemically and therapeutically, experiments on their preparation and properties are still proceeding. —*The Chemist and Druggist*, May 10, p. 636.

PHYSIOLOGICAL ACTION OF THE ACTIVE PRINCIPLES OF JEQUIRITY.[1]

By S. Martin and R. N. Wolfenden.

Klein has shown that the poisonous properties of the seeds of *Abrus precatorius* (jequirity) cannot be due to a bacillus, and Warden and Waddell (Non-bacillar nature of Abrus poison, Calcutta, 1884) showed it to be due to the action of a poisonous proteïd. The proteïds in the seeds are two in number, a globulin and an albumose, and the present paper relates to the physiological action of the first of these. The proteïds were obtained by extracting the crushed seeds with 15 per cent. solution of sodium chloride; they were precipitated from this extract by saturation with ammonium sulphate; the precipitate was redissolved by adding water; and from this solution the globulin was precipitated by dialysis, collected, washed and dried.

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[1] *Proc. Roy. Soc.*, 46, 94—100. Reprinted from *Jour. Chem. Soc.*, April, 1890, p. 398.

The actions ascribable to this globulin are the production of local œdema and inflammation when subcutaneously injected or applied to the eye, the presence *post mortem* of petechiæ beneath the serous membranes, and the occurrence of hæmorrhagic gastro-enteritis. It also produces a remarkable fall of body temperature after subcutaneous injection, and in lethal doses, it causes rapidity of breathing shortly before death. It has little or no effect on blood pressure. The activity of this globulin is destroyed by heating the solution to 75° or 80°, the temperature at which it enters into the condition of a heat coagulum.

In a second paper (*Ibid.*, pp. 100–108) S. Martin describes the toxic action of the *albumose* which was obtained by precipitating the proteïds of the seeds by means of alcohol. The precipitate was allowed to remain under absolute alcohol for several months; the globulin was thus rendered insoluble; the albumose, however, was freely soluble in water after this treatment. It gave the following reactions: The aqueous solution was neutral to litmus-paper, and gave no precipitate on boiling. Acetic acid and also nitric acid gave precipitates which dissolved on heating, and reappeared on cooling. Copper sulphate gave a precipitate soluble in excess of the reagent. Copper sulphate and potash gave a "biuret" reaction. Mercuric chloride gave a precipitate insoluble in excess of the reagent. The symptoms produced by the albumose closely resemble those noticed when the globulin is hypodermically injected. There is gradually increasing weakness, with rapid breathing and lowering of body temperature, but no convulsions or paralysis. It also causes severe conjunctivitis when applied to the eye. Its poisonous properties are lessened by heating at 70–75°, and completely destroyed at 85°.

The albumose is not, however, so powerful a toxic agent as the globulin, the dose necessary to produce the same effects being larger.

A comparison is drawn between the action of these proteïds and those of other poisonous substances of the same class, especially those in snake-venom.

The following table contrasts the activity of the venom of various snakes and of Abrus:

Common adder.—Fatal dose in man, 0·0021 gram per kilo. of body weight (Fontana).

Australian tiger-snake.—Fatal dose in dog, 0·00485 gram per kilo. of body weight.

Cobra.—Fatal dose in dog, 0·000079 gram per kilo. of body weight (Vincent Richards).

Abrus poison—

Globulin.—Fatal dose, 0·01 gram per kilo. of body weight.

Albumose.—Fatal dose, 0·06 gram per kilo. of body weight.

Peptic albumoses.—Fatal dose in dog, any dose over 0·3 gram per kilo. of body weight (Pollitzer).

METHYSTICIN.[1]

By C. Pomeranz.

This compound exists in the root of *Macropiper methysticum*, from which it may be best prepared by exhaustion with boiling 80 per cent. alcohol; the solution is concentrated and allowed to remain in a cool place for some days, when a crystalline deposit separates, and this on recrystallization from boiling alcohol furnishes pure methysticin in the form of inodorous, tasteless, prismatic needles melting at 137°. It has the formula $C_{15}H_{14}O_5$, is insoluble in cold water, only slightly soluble in hot water, light petroleum and ether, but is readily dissolved by boiling alcohol, and cannot be distilled unchanged. On treatment with potash or soda, the compound is dissolved with formation of the potassium or sodium salt, respectively of an acid which the author has named *methysticinic acid.* The free acid, $C_{14}H_{12}O_5$, crystallizes in yellow, prismatic needles resembling piperic acid, is sparingly soluble in ordinary solvents, dissolves readily in solutions of the alkalies, melts at 180° with evolution of carbonic anhydride, and is colored red by a solution of ferric chloride. On oxidation with a solution of potassium permanganate, it is converted into a compound identical with Fittig and Remsen's piperonylic acid, $CH_2{:}O_2{:}C_6H_3{\cdot}COOH[O_2 : COOH = 1 : 2 : 4]$, which melts at 227°, and gives a characteristic calcium salt.

Methysticol is obtained on boiling methysticinic acid with alkalies or dilute acids. It melts at 94°, is insoluble in alkalies, but is readily dissolved by alcohol or ether, crystallizes in flat prisms, forms a compound with phenylhydrazine, which melts at 143°, and has the formula $C_{13}H_{12}O_3$.

[1] *Monatsh.*, x, 783–793; reprinted from *Jour. Chem. Soc.*, March, 257.

In consideration of its behavior with potash, methysticin must be regarded as the methyl salt of methysticinic acid, $CH_2{:}O_2{:}C_6H_3{\cdot}C_7H_7O_3[O_2 : C_7H_7O_3 = 1 : 2 : 4]$, the group $C_7H_7O_3$, if methysticinic acid is regarded as a β-ketonic acid, being represented by the chain $—CH{:}CH{\cdot}CH{:}CH{\cdot}CO{\cdot}CH_2{\cdot}COOH$. The author has not succeeded in detecting the least trace of benzoic acid in the oxidation-product of methysticin (compare Nölting and Kopp, *Mon. Sci.*, 1874, 921).

BARK OF QUINA MORADA.[1]

(Pogonopus febrifugus, *Bentham et Hooker.*)

By P. N. Arata and F. Canzoneri.

The authors have examined a specimen of bark found in Bolivia and in the north of the Argentine Republic, commonly known as "cascarilla" or "quina morada," and credited with many of the therapeutic characteristics of the true cinchona bark. For a variety of reasons the authors consider it to belong to the Pogonopus febrifugus, *Bent. et Hooker.* In appearance the bark is irregular on the outside and scaly within; the color varies from yellowish white to reddish, and is a dirty white on freshly-exposed surface; it is soft and spongy to the touch, a little lighter than water, has a slightly bitter taste, scarcely any odor and burns very readily, leaving a white ash. It imparts a bluish fluorescence to water with which it has been boiled, and a yellowish blue fluorescence to alcohol.

The substance was extracted from this bark, namely, a blue fluorescent substance, moradin, and an alkaloid, moradeine.

To isolate these, the powdered bark is extracted with alcohol, the extract treated with an alcoholic solution of lead acetate, filtered, freed from lead and concentrated, when a crystalline deposit of moradin is obtained. The mother liquor is then treated with potash and ether, the ethereal extract treated with hydrogen chloride, and the precipitate of moradeine hydrochloride purified by again treating it with soda, water, etc.

Moradin contains no nitrogen, and its formula is either $C_{21}H_{18}O_8$ or $C_{17}H_{14}O_6$. The former agrees better with the composition of the acetyl derivatives triacetylmoradin.

Moradin crystallizes in slender, colorless needles, or in large

[1] *Gazzetta*, xviii, 409–421. Reprinted from *Jour. Chem. Soc.*, April, 1890, p. 404.

anhydrous prisms, and melts at 201–202°. It has the characters of an acid, but none of its salts could be isolated. Alkalies increases, and acids (except acetic) diminishes the fluorescence of its solutions. Ferric chloride gives a green coloration, and, after a time, a green precipitate, gold chloride gives a blue coloration and green precipitate. It is dissolved by concentrated sulphuric acid, forming a yellowish solution, from which it is re-precipitated unchanged on adding water. Although not a glucoside, it reduces Fehling's solution when heated with it; it also reduces silver nitrate and basic lead nitrate. Potassium permanganate in alkaline solution and ferric chloride in alcoholic solution oxidize it to quinone. The action of nitric acid is characteristic; the concentrated acid has no action in the cold, but forms oxalic acid on heating. On boiling with very dilute (4 per cent.) acid, quinhydrone and quinone are successively formed. Its reactions place it in the class of oxyhydroquinones, since it gives as products of decomposition a di or trihydroxybenzoic acid, which colors ferric salts green, a polyvalent phenol, probably hydroxyquinol and quinone. It is probable that two of the oxygen atoms are contained in the same way as in hydroxycoumarin (umbelliferon).

Triacetylmoradin crystallizes from its alcoholic solution in white, shining prisms which melt at 177 to 178°. It is not fluorescent, and has no acid properties. It is insoluble in alkalies in the cold, and decomposes when warmed with them.

Moradeine crystallizes in opaque, colorless prisms, very soluble in alcohol, ether, chloroform, etc., but only slightly in water. It melts at 199–200°, and exhibits the general reaction of an alkaloid, forming a well crystallized platinochloride and aurochloride, etc.

TRUE WINTER'S BARK.[1] (Drymis Winteri, *Forster.*)

By P. N. Arata and F. Canzoneri.

After an historical summary of the introduction of the bark into Europe, the author describes the genuine bark from the Straits of Magellan; this occurs in the form of deeply-furrowed, curled-up fragments with an earthy fracture, exhibiting, when in small pieces, an internal reddish-brown coloration. When fresh, it has a bitter and pungent taste and an agreeable odor, recalling both turpentine

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[1] *Gazzetta*, xviii, 527—539. Reprinted from *Jour. Chem. Soc.*, April, p. 405.

and cloves. The sun-dried bark yielded: water (at 110°), 13·713 per cent.; ash, 3·338 per cent.; soluble in ether, 3·841 per cent.; in alcohol, 6·465 per cent.; in water, 13·981 per cent.; ligneous matter, 49·200 per cent. An analysis of the ash is also given. The ethereal solution contains a peculiar essence, fatty compounds, resins, and waxy matter; the alcoholic extract contains reddish uncrystallizable resins. Citric acid was carefully looked for, but not found. The essence was isolated by distilling the bark with water, exhausting the distillate with petroleum, and distilling off the solvent. The crude oil, amounting to 0·6428 per cent. of the weight of the bark employed, is a mixture of several substances.

Winterene, $C_{15}H_{24}$, is the essential oil separated from this by fractional distillation. It passes over between 260° and 265°; sp. gr. at 13° = 0·93437. Index of refraction = 1·4931; sp. rotatory power at 16° $[\alpha]_j = +11·2$. It is readily oxidized on exposure to the air, becoming yellow. The formula $C_{25}H_{40}$ was calculated from the ultimate analysis and vapor-density, but the authors consider that the ready oxidizability of winterene and its analogy to similar essences points rather to the formula $C_{15}H_{24}$, which would place it in the group of sesquiterpenes, such as cedrene, cubebene, etc., the boiling points of which are between 250° and 268°.

Iodine dissolves in winterene producing a greenish-yellow coloration which changes to green after a time.

On adding picric acid containing a few drops of sulphuric acid to winterene, a yellowish-red, crystalline compound is formed.

Pure winterene is colored green by a solution of bromine in chloroform, orange-red by a solution of chloral hydrate in sulphuric acid, rose to yellow by concentrated sulphuric acid or by sulphuric acid and chloroform, dirty-yellow by Fröhde's reagent and by ferric chloride and sulphuric acid, rose to violet by nitric acid.

The reactions of the essence after oxidation are also given.

THE INDIAN GRASS OILS.[1]

By F. D. Dodge.

These are at least five in number, namely, oils of citronella, lemon-grass, Indian or Turkish geranium, ginger-grass, and vetivert or cus-cus. They are derived from various tropical grasses of the

[1] *Amer. Chem. J.*, xi, 456–469. Reprinted from *Jour. Chem. Soc.*, March, 231.

genus *Andropogon*, but there is some confusion as to the particular species from which the individual oils are obtained.

Citronella Oil.—The commercial varieties are often adulterated with kerosene; the pure oil is a clear, greenish-yellow liquid with a sharp burning taste and a strong aromatic odor. Its sp. gr. at 16° is 0·8770, at 26·5°, 0·8750. It distils between 200° and 240°, leaving 10 per cent. of a thick oily residue, having a pungent odor. It gives most of the reactions of aldehydes, combining with hydrogen sulphites and with phenylhydrazine, although not with ammonia; it also reacts with acetic and benzoic chlorides, and gives a mirror with an ammoniacal silver solution. Two litres of the oil were distilled in a current of steam, and collected in fractions of 1,100 cc. and 400 cc., the residue of 500 cc. not being readily volatile. The first fraction (1,100 cc.) was treated with a solution of sodium hydrogen sulphite, the mixture being kept cool with ice and water. The liquid solidified to a white magma, and the sodium hydrogen sulphite compound was then pressed between flannel and washed with ether; the filtrate yielded 350 cc. of residual oil. The sodium hydrogen sulphite compound was mixed with dry sodium carbonate and distilled in a current of steam; about 700 cc. of aldehyde was thus obtained. This was shown by analyses, and a vapor-density determination, to have the formula $C_{10}H_{18}O$, and is thus isomeric with borneol and geraniol. The author names it *citronellic aldehyde*, and considers it to be β-methyl-δ-isobutylallylacetaldehyde, $C_4H_9 \cdot CH{:}CH \cdot CH(CH_3) \cdot CH_2 \cdot CHO$, since this formula is most in accordance with its reactions. It unites with 2 atoms of bromine, and when reduced with sodium amalgam and acetic acid it yields *citronellyl alcohol*, $C_{10}H_{20}O$, boiling at 225–230°; this decolorizes bromine solution, and has a pleasant odor of roses. It forms compounds with phenylhydrazine, with aniline and paratoluidine, and with acetic acid, but these products have not yet been isolated. It is dextrorotatory, and when oxidized, appears to yield fatty acids; with potassium permanganate, it yields a mixture of acids smelling strongly of ordinary valeric acid. When treated with phosphoric anhydride, some large colorless plates (melting at 140°) were deposited, and two oils formed, one boiling at 175°, which was shown by analysis to be an impure terpene, and one boiling above 300°, which had a pleasant odor resembling the high-boiling fractions of citronella oil.

The 350 cc. filtered from the sodium hydrogen sulphite compounds yielded (1) 75 cc. of a light oil, boiling at 177°, and having a pleasant, citrene-like odor; this was analyzed and its vapor-density determined, the results indicating that it was an impure terpene; (2) 120 cc. of a thicker oil, of rose-like odor, boiling at 222–224°, and of sp. gr. = 0·8741 at 26·5°, which appeared to be citronellyl alcohol; (3) 100 cc. boiling above 240°, dark brown, viscid, and having a peculiar odor.

The residual 500 cc. of the original oil, not readily volatile in steam, was treated with sodium hydrogen sulphite, and yielded about 10 cc. of citronellic aldehyde, and a residual 475 cc. which, when distilled, behaved like the residue from the other sulphite precipitate, but yields a much larger amount of high-boiling products, which oxidize readily and are difficult to treat. Citronella oil therefore contains citronellic aldehyde and alcohol, together with a terpene and oils boiling above 240°. The study of these oils is to be continued.

ON MEDICINAL GELATINS.[1]

By Dr. Unna.

These preparations are indicated in superficial inflammatory affections when the skin is swollen, wet and itchy. Very high temperatures and profuse sweating forbid their use. For a general basis the following formula is given—the figures within parentheses being taken when a hard zinc gelatin is wanted.

℞—Zinc oxide,	15 (10)
Gelatin,	15 (30)
Glycerin,	25 (30)
Water,	45 (30)

In adding other drugs, the following directions may be useful:

(1) Cerussa, iodide of lead, white precipitate, sulphur, iodoform, chrysarobin in fine powder may be mixed in any proportion required. A proportion of five to ten per cent. added to soft zinc gelatin is recommended.

(2) Carbolic and salicylic acid, resorcin, naphthol, creasote and sulphide of potassium may be added to the hard gelatin basis in any proportion up to ten per cent.

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[1] *Deutsch. med. Zeit.*, Nov. 4, 1889. Reprinted from *The Medical Chronicle*, March, 1890, p. 508.

(3) Fats, balsams, tars and ichthyol all make the basis softer. The proportion added is usually from ten to twenty per cent.

(4) If we wish to combine drugs in rules 2 and 3, then the sum of the proportions must be attended to. For example, if resorcin and salicylic acid were both ordered, we should not prescribe more than five per cent. of each if we wish the gelatin to form a good covering.

(5) Powders may be combined in any proportions.

(6) Tannin, pyrogallol and oxide of mercury cannot be added to the basis.

(7) Corrosive sublimate up to three per cent, camphor, chloral, and camphor chloral all to two per cent., ext. cannab. indic. from two to five per cent., may be used with soft zinc gelatin.

The chemist is to dispense the different glues in pots, which are to be put in boiling water when the preparation is to be used. It is to be painted on the skin with a long-haired brush.

The diseases of the skin for which Unna's glues are recommended are :

Pruritus.—Zinc glue with ext. cannab. indic., chloral hydr., carbolic acid, creasote, salicylic acid, camphor, camphor chloral, etc.

Artificial Erythema and Eczema.—Two per cent. ichthyol or five per cent. sulphur instead of ordinary dusting powders.

Eczema Intertrigo.—Hard zinc glue with ten per cent. ichthyol or five per cent. resorcin.

Eczema, with Great Itching.—Two per cent. ichthyol or five per cent. ext. cannab. indic.

Peeling after Acute Eczema.—Two per cent. ichthyol or resorcin, five per cent. sulphur, or one per cent. salicylic acid.

Ichthyosis.—Two per cent. resorcin or five per cent. sulphur and ten per cent. fat.

Wounds and Ulcers.—Iodoform zinc glue.

Acne Pustulosa.—After opening the pustules paint with twenty per cent. sulphur or five to ten per cent. resorcin, one per cent. perchloride of mercury with or without two per cent. salicylic acid added to the zinc glue.

The soft zinc glue will form a useful protection to the sound skin near diseased areas, to which strongly irritating applications have to be made.

MANIOC, OR CASSAVA.

By E. Chenery, M.D., of Boston.

From the brief allusions to this substance by writers on materia medica, one would get but a slight idea of its importance as an article of diet in tropical countries, being the staple food for unnumbered millions of human beings—the staff of life in the West Indies, Brazil and on the Continent of Africa.

The plant from which this food is derived is known to botanists as *Janipha Manihot*, and is a shrub, six to twelve feet high and one or two inches in diameter. Except for the young leaves, which are used as greens, its whole value consists in its tuberous roots, which sometimes reach the enormous weight of thirty pounds, but usually range from one to three inches in diameter and from six to eighteen inches in length. The shrub is said to be a native of Brazil, where it is known as mandioca or tapioca. Cassada (or cassava) is its name in the West Indies. It is not grown from the seeds, but from cuttings, having surprising vitality; for a cane of it, like Aaron's rod, will bud and grow leaves in your hand. Hence, it is only necessary to cut the stick into pieces of six to twelve inches in length, and thrust them into the ground, and it matters little whether the ground has been first broken for it or not. In eight to eighteen months the tubers are in their best state to produce the nutritious food—seventy per cent. gluten and thirty of starch; but, at a later period, the gluten becomes less and the starch increases. There is no food product which compares with it in resisting drought. Even in the dryest seasons, it is like other trees "planted by the rivers of water," and whole fields are green with its foliage, while all else is brown with the scorching sun.

There are two varieties of the manioc, known as the sweet and the bitter; the first of which may be eaten with impunity, while the latter has a bitterish, milky juice, which is poisonous from containing prussic acid. But these roots are grated or otherwise reduced to a pomace, and then suspended in grass bags, when the poisonous juice drips out, or, being volatile, is dissipated by the heat in baking bread from it. The bitter variety is the principal kind used in British Guiana, while the sweet is the one mostly cultivated in Africa. The tapioca which comes into our houses is almost pure starch, and is made from the expressed juice of

the root, which, on standing, deposits in the form of powder, and which, if dried without heat, will remain so. If heat be applied, it takes the form of the irregular masses we are accustomed to see.

The root has the taste of chestnuts, and may be eaten raw. It is delicious, wholesome food when roasted in hot embers or broiled. If soaked till the skin can be drawn off and the fibrous heart drawn out and then dried, it makes good bread; or, if broken up and fried in palm oil and salted, it is a good relish, and the Africans call it *bomba*.

An extremely white and fine flour, called *fuba*, is made from the soaked and dried roots, and it is the chief food in Angola.

The flour makes a thick porridge or mush—*funje*. The water is boiled and salted and set off the fire; after which *fuba* is stirred in until it can be cut into blocks, which may be taken in the hands and eaten with molasses or dipped into chicken broth.

The staff of life on the Congo is *quanga*, or bread made from the manioc by soaking, peeling and pounding the soaked root into a pomace, and kneading and making into dough-loaves of four by six or ten inches. These loaves are wrapped in thin, tough leaves and bound, and then boiled in large earthen pots. Then the bread is ready for use; or it may be sliced and browned or broiled, as one prefers.

Farina from the manioc is prepared by grating the green root, drying in the sun, with all the starch and tapioca in it, browning it slowly over the fire; after which it is eaten by stirring it into soup or boiled beans.

Grate, strain and dry slowly in the sun, and you have a starch for puddings or any other purpose for which starch has demand in the market. Gluten being a nerve-food, indispensable to health and vigor of both body and mind, the great abundance of it in the cassada—nearly three times as much as in wheat flour—the cassada is pre-eminently "the staff of life," since there is no way by which its abundance of gluten can be wasted in preparation, as in wheat. There is a Providence here which shapes ends, since this chief food for tropical regions has so much nerve-supplying elements and so little of the heating elements, as compared with food in colder climates.

But this abundant gluten, as compared with other foods for the sick, pre-eminently fits it for the sick-room, and especially so when

we wish to increase strength instead of heat, and where any irritating and indigestible food-substances are forbidden. It requires longer boiling than starchy foods in general, and may be used in the form of thin mucilage or demulcent, or in a more solid form with sugar, lemon juice, nutmeg or other aromatics. I suspect that, as physicians, we should make immense gain in restoring from prostrating sicknesses by using more of this eligible substance in place of so much meat slops, and especially so in cases complicated with more or less gastric irritation. Meat foods must be excluded from the stomach in gastric ulcer. Why not, then, fall back upon this highly nitrogenous food for supporting the strength? Having so large a proportion of gluten over the starch, it offers immense advantages over wheaten and other bread in cases of diabetes where any starch at all is allowable.—*The Times and Register*, April 5, p. 318.

ADULTERATION OF FOOD.[1]

In his annual address, delivered Jan. 23, 1890, before the Chemical Society of Washington, the retiring President, Mr. Edgar Richards, said that, from want of reliable information in regard to the materials employed in most new food products, there is a general feeling of uncertainty and insecurity on the subject. People, as a rule, imagine that any substance used as an adulterant of, or a substitute for, a food product is to be avoided as itself being injurious to health; and when they hear that a certain food is adulterated, or is a food substitute, there is immediately a prejudice excited against the article, which it takes time and familiarity to allay. A moment's reflection ought to show that it would be directly contrary to the food manufacturer's interest to add to, or substitute anything for, a food product which would cause injurious symptoms, as in that case his means of gain would be cut off by the refusal of consumers to buy his product. It is true that the unscrupulous manufacturer or dealer does not hesitate to cheat his customer in the interest of his own pecuniary profit and gain, but he does not want to poison him. Where, through carelessness or ignorance, injurious substances, such as the arsenic, copper, aniline, and other metallic and organic poisonous salts sometimes used for

[1] *Science*, Feb. 7. Reprinted from *Med. and Surg. Rep.*, June 14.

artificial colors, are added to foods, their presence is promptly revealed by the dangerous symptoms which they call forth in the consumer. About a year ago, some Philadelphia bakers added chromate of lead to color their cakes, and caused the death of several persons, and serious illness in nearly every one who ate any of these products.

The great majority of substances used for food adulterants or substitutes consist of cheap and harmless substances, which are not injurious to health, as the following list of those most commonly met with in the principal food products will show. This list has been compiled from the reports of the State Boards of Health, the returns of the British Inland Revenue Department, the reports of the British Local Government Board, and those of the Paris Municipal Laboratory.

FOOD PRODUCTS AND THEIR CHIEF ADULTERANTS.

Food Product.	Adulterants.
Milk,	Water, removal of cream, addition of oleo-oil or lard to skimmed milk.
Butter,	Water, salt, foreign fats, artificial coloring-matter.
Cheese,	Lard, oleo-oil, cottonseed-oil.
Olive-oil,	Cottonseed and other vegetable oils.
Beer,	Artificial glucose, malt and hop substitutes, sodium bicarbonate, salt, antiseptics.
Syrup,	Artificial glucose.
Honey,	Artificial glucose, cane sugar.
Confectionery,	Artificial glucose, starch, artificial essences, poisonous pigments, terra alba, gypsum.
Wines, liquors,	Water, spirits, artificial coloring-matter, fictitious imitations, aromatic ethers, burnt sugar, antiseptics.
Vinegar,	Water, other mineral or organic acid.
Flour, bread,	Other meals, alum.
Bakers' chemicals,	Starch, alum.
Spices,	Flour, starches of various kinds, turmeric.
Cocoa and chocolate,	Sugar, starch, flour.
Coffee,	Chicory, peas, beans, rye, corn, wheat, coloring-matter.
Tea,	Exhausted tea-leaves, foreign leaves, tannin, indigo, Prussian blue, turmeric, gypsum, soap-stone, sand.
Canned goods,	Metallic poisons.
Pickles,	Salts of copper.

The use of flours and starches of various kinds—wheat, corn, rye, peas, beans, etc.—as food adulterants cannot be considered injurious to health. However much the public may be cheated in the purchase of such adulterated articles of food, as ground spices,

coffee, etc., they are not poisoned by their consumption. It is a question how much a purchaser is himself to blame, in his endeavor to secure a "bargain," when he demands so great a quantity of any given material at less than it can be purchased at wholesale in the market, that he compels the unscrupulous manufacturer to make a compound which has never more and generally less than the proportion of the genuine material represented by the price asked.

Many articles of food spoil in transportation; and, under the plea of preventing further fermentation, resort is had to antiseptics, such as salicylic acid, sulphite of soda, borax, etc. These deserve mention as being additions to foods of a class of substances used to cloak carelessness in manufacture and otherwise, and producing in many cases deleterious effects on the human economy. In France and Germany the use of such antiseptics as salicylic acid in food products is prohibited, although in the latter country such addition is tolerated when the food product is exported to countries where such use is not prohibited.

ON THE THEORY OF ABSORPTION OF FAT.[1]

By Dr. Minkowski.

The absorption of water even is subject to other laws than those of pure filtration and diffusion—"vital forces," meaning by the expression a sum of chemical and physical occurrences not yet thoroughly made out, come into play and complicate what was once considered a simple problem. With fat there are more complications, and, consequently, a host of theories. Amongst these, two stand out prominently. The one holds that the fat is first converted into a fine emulsion, of which the individual droplets are carried into the lacteals either by the activity of the cylindrical epithelium of the mucous membrane, or according to another view, by the agility of the leucocytes, who sally out between the cells, capture the globules of fat, and retire with them by the way they came into the lacteals. The second theory is that the neutral fat is split up in the bowel into glycerin and fatty acids. The fatty acids are then saponified by the alkalies, in the secretion of the intestine, and absorbed in the form of soluble easily diffusible soap. Once

[1] *Berliner klin. Woch.*, No. 15, 1890. Reprinted from *The Med. Chronicle*, June, 1890.

absorbed, it is reconverted into fat. The fact that fats are split up in the intestine, and that the organism can form fat out of fatty acids are points in favor of this theory. In this second theory, the porter-like activity of the cells, fixed or wandering, is dispensed with.

A third theory, the one held at present by most physiological chemists, maintains that the main part of the fat is absorbed as neutral fat in the form of an emulsion, but that to form this emulsion, part of the fat must have been previously broken up. An alkaline carbonate will not form an emulsion with neutral fat, but forms a soap at once with free fatty acids. Suppose a neutral fat intimately mingled with fatty acid and acted on by an alkaline carbonate; everywhere between the molecules of neutral fat will lie molecules of soap, and the result will be an exceedingly fine emulsion. All that is required is first a breaking up of the fat to a slight extent, so as to afford fatty acids which are saponified by the various alkaline secretions poured into the intestine. These are the secretions of the follicles of Lieberkühn (succus intestinalis) the bile, and pancreatic juice. The intestinal juice, according to most authors, excepting Schiff and Hoppe-Seyler, acts on the fat; and Bunge, from its richness in carbonate of soda, puts stress on its action in neutralizing the acids of the alimentary tract and emulsifying fat. The bile, beyond question, assists in the absorption of fat, but how it acts is not yet decided. In its absence the absorption is lessened but not stopped. What *rôle* does the pancreas play? The whole pith of the paper lies in the answer. The pancreas was completely removed in dogs by the author and Mering, and, with the exception of milk, all other fatty substances, *e. g.*, butter, olive oil, yolk of egg, fat of meat, even if given in the small quantities of 25 to 30 grains per day, were completely recovered from the fæces. When the food was mixed with fresh pancreas of pig, the greater portion of the fat was absorbed. It follows from this that, for the absorption of fats, the secretion of the pancreas is indispensable, and that no other can take its place. How does the pancreas act? Not by simply splitting up the fat, as fat broken up (*e. g.*, Lipanin with 6 per cent. fatty acid) was not absorbed; besides, fat was voided split up, although the pancreas was removed. Neither is the fat absorbed in the form of soap, since where the pancreas secretion enters the bowel the reaction is *acid*, and, what is even more to the point, soap

given in the food was completely voided as partly free and partly combined with alkalies. Of course, this last result also disposes of the theory of partial splitting up of the fat to permit of the rest being emulsionized by the alkaline secretion of the bowels.

Does then the pancreas act by stimulating the bowel's powers of absorption? No, for milk is absorbed after extirpation of the pancreas. It seems then the absorption depends on the shape in which the fat comes in contact with the mucous membrane of the intestine. In milk the form is that of a fine emulsion, differing (and this is an important point) from a soap emulsion in the extraordinary minuteness of the globules, and in its power of stability (haltbarkeit). It remains unaffected in an acid solution, whilst an alkali emulsion liberates its fat so that the globules run together to form large drops. A pancreas solution behaves like the milk.

Minkowski then has got thus far: "All fats, with the exception of milk, require to be acted on by the pancreas before they can be absorbed." The minute action, the method of absorption, still remains unsolved.

It is some months until the secretion of the pancreas becomes active in a child, and hence, it is supposed, milk is made absorbable without it

A curious result of the experiments was, that when the pancreas was but partially extirpated, and the part left not in connection with the bowel, the absorption of fat was diminished, but it by no means ceased.

COD LIVER OIL.[1]

By M. Gautier and L. Mourgues.

Richter, Schenck, De Jongh, Trousseau and Pidoux, Walsche, Oberghaus, Bouchardat, and a great number of other French, Dutch and German medical men consider the light-colored and brown cod liver oils to be the most efficacious. On the other hand, English doctors generally, and a number of medical men in other countries recommend by preference the white oils, on the ground that they are more acceptable to patients, especially to infants, who are the

[1] Translated from an extract from a work by Messrs. Gautier and Mourgues, published in the *Journal de Pharmacie*, March 1, p. 253. Reprinted from *Phar. Jour. and Trans.*, June 14, p. 1018.

principal consumers, and that they are often better digested; further, the objection is sometimes raised that the brown oils may be the product from altered livers.

The authors describe the preparation of the oil in Newfoundland and Bergen. The fresh livers heated to about 60° C., either in a water-bath or in the presence of steam, yield an oil which, filtered through flannel, constitutes the white oil. If the livers are not treated immediately, they quickly undergo a commencement of fermentation, or rather of auto-digestion, which is not a putrid or ammoniacal fermentation under the influence of bacteria, for the mass does not become alkaline or rancid, but acquires an acidity that amounts to 0·4 to 0·8 gram of monohydrated sulphuric acid per kilogram. The envelopes of the hepatic cells are broken and partly liquefied and the minute drops of fat from the hepatic tissue saturate more and more the colored substances that exist in the liver. The ferments of the biliary parenchyma determine an action comparable to the lactic and butyric acidification of flesh after the cessation of life. The oil obtained under these conditions, after some hours' or days' standing of the livers, is pale colored or brown, and it owes its color and greater activity to the biliary matters that it holds in solution. It requires days, and even weeks, before the livers, left to themselves, undergo putrid fermentation in the cold countries where the industry is carried on.

The residue from this first treatment is subjected to boiling with water, but the oil so obtained is thick, dark and rancid, and has a fetid odor; it is employed for industrial purposes, not in pharmacy. It follows therefore that the pale colored and brown oils, properly manufactured, are not derived from livers tainted by putrid fermentation, and their great activity is explained by the fact that the fatty matter is charged with biliary principles to which reference will be made subsequently. This was the conclusion arrived at also by De Jongh.

It must not be lost sight of, however, that in special cases, the white oil may be preferable, not only because it is better tolerated, but also because it contains a larger proportion of phosphorus and extractive matters, to which the authors, like others, attribute a great part of the efficacy of cod liver oil in the reconstitution of the system.

In operating for the separation of the alkaloidal and other prin-

ciples from cod liver oil, the authors treated 100 kilograms of oil methodically with an equal volume of 35° alcohol, containing 3 grams of oxalic acid per litre. The oil was shaken with the alcohol in twenty glass bottles each of fifteen litres capacity, the free part of which was filled with carbonic acid to avoid the action of air upon the oil. After standing, the alcoholic liquid was siphoned off, exactly neutralized with milk of lime and evaporated *in vacuo* at a temperature not exceeding 40° C. Under these conditions the mixture remained limpid and nearly colorless. When it had been reduced to one hundredth of its original volume it was neutralized by precipitated calcium carbonate, filtered, and the desiccation finished *in vacuo*.

If it be desired simply to extract from this residue the total basic substances it contains, without regard as to the manner in which they are combined, the product of the evaporation is treated with 80° alcohol, and the extract is filtered or distilled until all the alcohol has passed over and concentrated *in vacuo*. In this way a syrupy extract is obtained to which caustic potash is added in fragments to liberate the bases. These are separated by shaking the mixture with ether, then precipitating the bases from the ethereal solution by means of an ethereal solution of oxalic acid, washing the precipitate with ether and drying. The scarcely colored dry oxalates obtained from 100 kilograms of oil weighed 52 grams.

In order to obtain the bases free, the salt is dissolved in the smallest quantity of water and the solution is treated with caustic potash. Under this treatment the alkaloids usually rise to the surface like a thick brown oil, which is due to the solution of two fixed bases in the oily bases.

The treatment with alcohol, acidulated with oxalic acid, removes from the oil nearly the whole of the bases. In the authors' experiments the quantity obtained varied between 0·380 gram and 0·485 gram per kilogram of the brown oils; but from the pale oils the yield was inappreciable, even when operating upon ten kilograms. If account be taken of the fact that a trace of basic substances remain in the oil after treatment with acidulated alcohol, it will be seen that the total bases contained in a kilogram of brown oil amounts to about half a gram. That would be about 6·5 milligrams of base, or 10 milligrams of the sulphates in each tablespoonful (13 grams) of oil, a quantity that, considering the powerful action of these bases, cannot be without effect on the economy.

Twenty-five grams of the mixture of oxalates dried over recently fused caustic potash yielded 12·5 grams of anhydrous bases. These were submitted to careful fractionation, first in air to a temperature of 120° C. and then *in vacuo*. Different alkaline liquids passed over in succession, and there remained a brown magma of bases that were solid or undistillable without decomposition. These were separated by converting them into hydrochlorides or platinochlorides.

After careful repetition of these operations the bases in cod liver oil were classified as follows:

(1) Fraction boiling at 87°–90°, under a pressure of 770 millimetres—*butylamine*. This portion constituted about one-sixth of the total bases.

(2) Fraction boiling from 90° to 100°, under the same pressure, with a fixed point 97° and 98°—*amylamine*. This fraction constituted one-third of the whole.

(3) A small fraction boiling above 100° and below 115°, consisting especially of *hexylamine*.

(4) Fraction boiling towards 100°, under a pressure of 6 centimetres of mercury, or at from 190° to 200° under ordinary pressure. This consists of a new base, *dihydrotoluidine*, and constituted about one-tenth of the total alkaloids.

(5) The fifth portion included the fixed bases. The basic residue that could not be distilled, being treated with dilute hydrochloric acid, dissolved almost completely. This solution, which was slightly colored, gave immediately with platinic chloride a flesh-colored precipitate, alterable in light, which was separated from the mother-liquor, and dried upon biscuit porcelain. From this platinochloride a hydrochloride was prepared from which a fixed base, named by the authors *aselline*, was obtained by precipitation with potash.

Upon concentrating the mother-liquor a second platinochloride, much more soluble than the first, was deposited of constant composition to the end. From this was obtained a sixth alkaloid that constituted about one-third of the total alkaloids of the oil. This substance, which is considered by the authors to be one of the most efficacious principles in cod liver oil, has been named *morrhuine*.

There remained in the potassic liquor, after the basic substances had been removed, the different fixed and volatile acids with which the bases were combined when dissolved out by the acidulated

alcohol. To this liquor, exhausted by ether, was now added a little sulphuric acid, and the following acids were obtained:

(1) A remarkable acid, which appears—especially when the liquor is heated a little—as a brown viscous mass, slightly soluble in water, having a disagreeable, slightly aromatic odor, recalling that of oils derived from marine algæ. It solidifies slowly in the cold and may be obtained crystalline after purification. The authors have named it *morrhuic acid.*

(2) Upon distilling the acidulated liquor, after the morrhuic acid had been separated, there passed over a mixture of *formic* and *butyric acids.*

(3) There still remained in the liquor (*a*) a small quantity of morrhuic acid in solution, removable by alcoholic ether when the solution had been evaporated; (*b*) a certain proportion of phosphoric acid, derived from the phosphates, phosphoglycerates and lecithines of the oils; (*c*) a little sulphuric acid having the same origin.

(4) These various acids having been separated, the residue was finally precipitated with subacetate of lead. After having filtered and removed the lead strong alcohol took up an extract having a nauseous odor. In the fractions of this extract boiling towards 180° *in vacuo,* the presence of glycerin was determined by converting it into acrolein. Glycerin, therefore, accompanies phosphoric acid in the complex substances removed by alcohol from cod liver oil, being partially combined with it, for after neutralization of the acid extract with lime phosphoric acid again makes its appearance in the liquor if it be boiled with a mineral acid. Phosphoric acid and glycerine are in fact contained in these oils in the form of lecithines.

The foregoing, with traces of coloring matters, are the alkaline and acid constituents separable from cod liver oil. Among them, only butyric, phosphoric and sulphuric acid had been noticed before. The special constituent which communicates to cod liver oil the characteristic property of giving a fine violet color when treated in the cold with strong sulphuric acid is not met with in the acidulated extract, alcoholic or aqueous.

Referring to the properties of these constituents, the authors state that butylamine, in sufficient dose, produces in animals fatigue, stupor, vomiting and a certain degree of paresia; it excites the production of urine.

The amylamine from cod liver oil is a very active base. In a

small dose it excites the reflexes and promotes the urinary secretion. In a large dose it provokes convulsive trembling, then true convulsions and death.

Hexylamine has an action very similar to that of amylamine, but much less intense.

Dihydrotoluidine ($C_7H_{11}N$) occurs as a colorless oil, having a brisk, not unpleasant odor, very alkaline and slightly soluble in water, upon which it floats. It attracts carbonic acid strongly from the air. Its hydrochloride is bitter, and crystallizes in very soluble confused needles or lamellæ. The nitrate reduces silver nitrate. The yellow platinochloride is readily precipitated, but is re-dissolved by heat. The aurochloride, soluble in the cold, forms long needles arranged like a fan. Dihydrotoluidine is a convulsivant toxic base.

Aselline occurs as a non-hygroscopic amorphous mass, with a density of 1·05. It turns yellow in air and light. When cold it is odorless; but it melts at about 100° C., and the viscous liquid has a sweetish aromatic odor, recalling that of some ptomaines. Aselline is very slightly soluble in water, to which it communicates a faint bitterness and alkalinity. It is soluble in ether and especially in alcohol. The salts formed by it with acids are crystalline, but dissociate partially in water, especially when heated. In a sufficient dose aselline produces dyspnœa, stupor, convulsive disturbances, and with a still larger dose death.

Morrhuine ($C_{19}H_{27}N_3$) is a very thick oily liquid, with an odor recalling that of lilac or acacia flowers. It is lighter than water, in which it is slightly soluble, and is very soluble in alcohol and in ether. It is very alkaline and caustic to the tongue and attracts a little carbonic acid from the air. The hydrochloride crystallizes in stars formed of acutely pointed needles, which are very deliquescent. The aurochloride forms a yellow precipitate. The platinochloride, which is rather soluble and alters rapidly in warm aqueous solution, crystallizes in microscopic barbed needles. The salts of morrhuine are not precipitated by mercuric chloride, but are by the double iodide of mercury and potassium. Morrhuine is a powerful stimulant of the functions of nutrition and assimilation; it produces a rapid circulation of the extractive residues of cell life towards the blood and the kidneys, where they are eliminated, provoking in this way indirectly a powerful movement of assimilation correlative of the losses consequent upon the inverse movement of de-assimilation.

This is considered to have been demonstrated by the super-excitation of appetite in animals brought under its influence.

As before stated a portion of the bases just described are combined in the oil under the form of lecithines. It is impossible, in fact, to concentrate an alcoholic extract made in presence of a mineral acid, although dilute, without the gradual deposition in the cold of a viscous acid to which the bases were originally joined; at the same time phosphoglyceric acid makes its appearance. The lecithines do not exist in the white or slightly colored oils; neither do the alkaloids, which is considered to be another proof that these bases occur under the form of complex phosphoglyceric compounds.

According to De Jongh, the brown oils contain per kilogram 0·789 gram of pre-existing phosphoric acid, removable by saponification, while the total phosphoric acid obtained by oxidation of the oil was 1·047 grams, but in the pale oil the quantities obtained were respectively 0·913 gram and 1·397 gram. It follows therefore from these figures that the phosphoric acid and phosphorus are not entirely derived from lecithines, for the oils yielding the most are those that do not contain phosphoglyceric compounds. Moreover, the organic phosphorus occurs in these oils in a form other than that of phosphoric acid capable of combining with alkalies; the phosphorus that becomes apparent only upon total oxidation of the oily substance is sensibly more abundant in the pale oils free from lecithines. Consequently, this phosphorus occurs in all the oils, pale or brown, in a form other than that of lecithines; and since it is not fully saturated with oxygen and constitutes part of a complex organic molecule, there can be no doubt that it is essentially assimilable and suitable to the reparation of tissue.

Morrhuic acid ($C_9H_{13}NO_3$) is peculiar to cod liver oil, from which it is deposited slowly and gradually in the cold, more rapidly when the acidulated alcoholic extracts are concentrated by heat. It follows the bases in the various processes of extraction, and appears to be united with the principal of them in very instable combination. In order to separate simply the morrhuic acid it suffices to exhaust the oil with hydrochloric acid diluted with twenty times its volume of water, separate and filter the supernatant liquor, saturate with potassium carbonate and concentrate *in vacuo* at 45° to 50°. The acidulated residue is taken up by strong alcohol, and upon evaporating the alcohol and adding water, the acid is precipitated as a brown

resin that rises to the top of the water, in which it dissolves partially when heated. To purify this acid it is dissolved in dilute potash solution, the liquor neutralized with nitric acid and acetate of lead carefully added. The first brown precipitates that form are separated and rejected, and there is obtained afterwards a grayish-white plumbic precipitate, from which can be separated by treatment with sulphuretted hydrogen, a dirty yellow body that crystallizes in prisms or in square plates bristling with points. The formula attributed to this acid, as the result of analysis, differs from that of tyrosine ($C_7H_{11}NO_3$) only in containing two atoms of hydrogen more.

Morrhuic acid is a weak acid, which reddens litmus, decomposes carbonates, is easily soluble in alkalies, with which it forms salts that precipitate the acetates of lead and nitrate of silver, but not acetate of copper. It is slightly soluble in hot water and separates from it partially on cooling in the form of an emulsion. The solutions have a slightly bitter disagreeable taste; their aromatic odor sometimes recalls that of cod liver oil and sometimes that of sea-weed. Upon very slow evaporation of a dilute alcoholic solution the acid crystallizes in prisms having a square base, or in large plates, but a considerable proportion remains a long time in the form of oleaginous drops. Morrhuic acid belongs to the pyridic series of compounds, though it cannot be properly called a carbopyridic acid for it is not precipitated with heat by acetate of copper, but a pyridic acid having a constitution recalling that represented by phenyllactic acid (C_6H_5—CHOH—CO_2H) or cinnamic acid in the benzene series. It behaves both as a moderately energetic acid and as a weak base.

The substance described by De Jongh under the name "gaduine" appears to correspond with morrhuic acid. This substance, which is perfectly harmless, possesses most powerful diuretic properties, quite similar to those the authors have recognized in morrhuine. Under the influence of morrhuic acid, the urine of guinea pigs, usually scanty and turbid, augments considerably in quantity and rapidly becomes clear, at the same time the animals attack food with avidity. These characters show, in the authors' opinion, that morrhuic acid, like morrhuine, excites the assimilatory functions and the appetite. The bases properly so-called exist in cod liver oil in small quantity, but morrhuic acid occurs in it to the extent of upwards of a gram per litre. It would appear therefore to be one of the most important agents in the efficacy of the oil.

But the authors do not consider that the undeniable reparative action of the oil is entirely due to the alkaloids and morrhuic acid, since this is attributable to three groups of special agents. In the first place the oil acts by its fatty bodies, which are eminently assimilable in consequence of their slight acidity and partial saponification, the latter being due to the influence of hepatic ferments and the solution in the oil of a certain quantity of biliary matters that render emulsification easy, especially under the influence of the pancreatic juice. These fatty bodies are energetic reconstituents of the tissues through their richness in phosphates, phosphoglyceric acid, lecithines and organically combined phosphorus, the phosphorus being presented to the system under the form in which it exists in milk, eggs, the brain, legumin, nuclein, etc. Secondly, bromine and iodine, which are present in the oil in minute quantities (0·030 gram to 0·040 gram of iodine per litre), contribute doubtless also to the reparative action. Lastly, cod liver oil acts by the morrhuic acid it contains, as well as by its bases, several of which, butylamine, amylamine and especially morrhuine, excite the nervous system, accelerate denutrition, as indicated in the considerable increase of urine and sweat excreted, and correlatively augment the appetite.

AMERICAN PHARMACEUTICAL ASSOCIATION.

The thirty-eighth annual meeting of the American Pharmaceutical Association will be held at Old Point Comfort, Virginia, first session, Monday, September 8, at 3 P.M.

Although I have no official notice on the subject, I understand that the Virginia Pharmaceutical Association have postponed their meeting to the same date, with the intention of holding it simultaneously with that of the A. P. A. and at the same place.

In view of our convention being held in such a delightful location and one so easily accessible from all parts of the country, it is hoped and expected that we will have one of the largest meetings held for years.

Full information regarding hotel and railroad rates will be furnished our members later on, in the usual annual circulars.

All matters concerning exhibits, etc., will be taken in charge by the local Secretary, Mr. Charles E. Dohme. Any communications, in regard to same, sent to his address, cor. Pratt and Howard Streets, Baltimore, Md., will receive prompt attention.

All papers to be read at the next meeting should be forwarded at as early a date as possible to Prof. H. M. Whelpley, No. 113 Market Street, St. Louis, Secretary of Committee on Scientific Papers.

Owing to the lamented death of our much esteemed President, Prof. Emlen Painter, it devolves on the undersigned to issue this call.

KARL SIMMON,
Acting President.

ST. PAUL, MINN., June 18, 1890.

PHARMACEUTICAL ASSOCIATIONS.

The Alabama Pharmaceutical Association met in Tuscaloosa, May 13. Besides the usual routine business, the most important action taken was in regard to the exemption of druggists from jury duty, the Committee on Legislation being instructed to prepare a bill for consideration by the Legislature. The reading of a paper by Dr. Humphries on the cutting of prices in the sale of proprietary articles elicited the accustomed animated discussion, but though the practice of cutting was denounced as unprofessional, a practical remedy does not appear to have been proposed. The Secretary, Mr. P. C. Candidus, was the recipient of a gold-headed silk umbrella presented to him in recognition of his valuable services.

The executive officers for the current year are: W. F. Punch, Mobile, President; E. P. Galt, Selma, Treasurer, and P. C. Candidus, Mobile, Secretary. The next meeting will be held at Huntsville, on the second Tuesday in May, 1891. J. L. Risin was elected local Secretary.

The Kansas Pharmaceutical Association held its eleventh annual meeting in Music Hall, Topeka, May 20–22, President Allen in the Chair. An address of welcome was delivered by Governor Humphrey, who encouraged the association in the endeavor to benefit the public through the advancement of pharmacy, and suggested that the Legislature would give all reasonable aid. The President's address was very brief; the Secretary and Treasurer presented their reports, as did also the various committees. Amongst the papers read were the following: On the advisability of recognizing by the Pharmacopœia patented chemicals, like antipyrine, etc., by M. L. Stone; on the preparation of Dover's powder, by J. T. Moore; on abstracts and trituration, by M. Noll; on commercial chocolates, by G. F. Wida; on adulterations, by Prof. L. E. Sayre, etc. The question of periodical registration was discussed, since the fee from registration was found to be insufficient to enable the State Pharmacy Board to fully carry out the law; the subject was referred to the Executive Committee with full power.

The election of officers resulted in the choice of C. D. Barnes, Abilene, for President; J. T. Moore, Lawrence, Secretary, and H. W. Spangler, Treasurer. The former Treasurer, Mr. Mehl, having declined re-election.

The invitation extended by C. L. Becker was accepted, and Ottawa was selected as the place for holding the next meeting in May, 1891.

The Missouri State Pharmaceutical Association assembled at its twelfth annual meeting at Excelsior Springs, June 3–5. The President's annual address was made by C. E. Corcoran, and reports were read from the Secretary, Treasurer, several delegations, and various committees. A report made by Mr. Alexander, member of the State Pharmacy Board, resigned, showed that 470 physicians had registered under the amended law without examination; quite a

lively discussion was caused by this announcement. The subject of pharmacopœial revision received much attention, and efforts will be made to present the views of the Missouri pharmacists to the Committee on Revision recently appointed at Washington. Pertaining to the same subject is the metric system of weights and measures, which was discoursed by Professors Curtman, Whelpley and Good, many members participating approvingly in the discussion, which followed these addresses.

An interesting affair was the exhibition of about 200 preparations made in accordance with the National Formulary by students of the St. Louis College of Pharmacy under the supervision of Prof. Hemm. For several years past, Mr. R. J. Brown and others have interested themselves in Inter-State Pharmaceutical Meetings, and the time seems to be near when such a meeting will be held as a "Conference of the Western Inter-State Associated Pharmacists," the initial meeting to be constituted of ten delegates each from the states of Arkansas, Illinois, Indiana, Iowa, Kansas, Missouri and Nebraska.

The executive officers for the current year are: W. E. Bard, Sedalia, President; G. H. C. Klie, St. Louis, Secretary, and G. J. Meyer, Treasurer. The Association will meet again at Excelsior Springs, on the second Tuesday of June, 1891; M. Cravens is local Secretary.

The Nebraska State Pharmaceutical Association convened at its ninth annual meeting in Washington Hall, Omaha, May 13, President Goodman in the chair. The Association was welcomed to the city by Mayor Cushing. The President's address referred to the desirability of having more papers read at the annual meetings; to the inroads made by patent medicines; to shorter business hours and closing on Sundays; to the selling of liquors by apothecaries, etc. Reports were read from the State Board of Pharmacy, from the Secretary, the Treasurer and the various committees and delegations to other societies. In view of the fact that prohibitory laws had resulted in transferring the traffic in liquors to the drug stores, thus degrading the aims of pharmacy, the association declared itself as being not in sympathy with the proposed prohibition amendment to the Constitution of Nebraska. The recommendation of the Committee on Legislation, that no amendments to the pharmacy law were desirable at present, and that the inauguration of the School of Pharmacy be deferred for further consideration, met with the approval of the meeting. Mr. C. J. Daubach, Lincoln, was elected President; J. Forsyth, Omaha, Treasurer, and Mrs. Julia M. Crissey, Omaha, Secretary. The next annual meeting will be held in Beatrice, May 26, 1891, the local Secretary being J. D. Rainey.

The Tennessee State Druggists' Association met at its fifth annual meeting in Nashville, May 21. The proceedings commenced with an address by Professor Dudley, of Vanderbilt University, the annual address by President Dowdy, and the reports of officers and committees. The report on trade interests was followed by a discussion resulting in the appointment of a committee charged with the drafting of an address in relation to the prescribing by physicians of proprietary and secret preparations. After the adoption of this address, the committee presented the same to the American Medical Association, then in session in Nashville. The draft of a pharmacy law for the state was presented by a committee, and after discussion referred to a committee to present the same to the Legislature.

The officers for the current year are: A. A. Yeager, Knoxville, President; J. L. Thompson, Nashville, Secretary, and E. L. Laurent, Nashville, Treasurer. At the next meeting, which will be held at Knoxville on the third Wednesday of May, 1891, a competitive exhibition will take place of preparations made by pharmacists of Tennessee.

The Texas State Pharmaceutical Association held its meeting in San Antonio, May 13. An address by Mayor Walthall, President Williams' address, and the usual routine business occupied the first day's session. On the two following days, the reports of officers and committees were read and discussed; several papers were read; the sum of $200 was voted to be annually awarded for four prizes for papers presented at the meetings; Houston was selected for holding the next annual meeting, on the second Tuesday of May, 1891, and the following executive officers were elected: President, W. B. Morrison, Waco; Secretary, L. Myers Connor, Dallas; Treasurer, E. W. Lancaster, Marshall, and J. Burgheim, local Secretary.

The Pennsylvania Pharmaceutical Association convened at its thirteenth annual meeting at York, June 10, President J. W. Miller, of Allegheny, in the Chair. Second Vice-President Patton having been absent from the meeting, held last year, was introduced to the Association. Mr. H. A. Hay, the Chairman of the local committee, introduced Mayor D. K. Noell, who in welcoming the members to the city of York, related some reminiscences of his brief career as a druggist's apprentice nearly sixty years ago. Treasurer Lemberger replied to the address of welcome in appropriate terms. A Committee on Reception and Introduction, consisting of the local Secretary, Second Vice-President and three other members was appointed.

The President then delivered his annual address, in which the work done during the past year was reviewed, and a number of suggestions were made with the view of increasing the usefulness of the Association, the latter being referred to a committee consisting of Messrs. McGarrah, of Scranton; Prichard, of Tyrone, and George, of Harrisburg.

A resolution was adopted extending the courtesies of the floor to the physicians of York and vicinity, and a committee was appointed to receive and report on credentials of delegations appointed to this meeting.

Reports were received, and disposed of, from the Executive Committee, the Secretary and the Treasurer, the latter reporting the receipts during the year to have been $1,462.27, the total expenses, $685.14, and the balance on hand, $777.13.

After the appointment of a Committee on the Time and Place of the next annual meeting, an adjournment was had until 8 o'clock P.M.

At the second session the following officers were elected: J. H. Stein, Reading, President; J. F. Patton, York, and W. H. McGarrah, Scranton, Vice-Presidents; J. L. Lemberger, Lebanon, Treasurer; J. A. Miller, Harrisburg, Secretary, and J. H. Redsecker, Lebanon; C. T. George, Harrisburg, and W. Harris, Hamburg, Executive Committee.

Reports were received from the Committees on Legislation, on the Revision of the Pharmacopœia, on Credentials, and others. A touching reminiscence was that of Mr. J. W. Colcord, who was present as a delegate from Massachusetts, and who, in 1863, after the battle of Gettysburg, lay wounded in the lecture hall of the Odd Fellows' Building, where the present meeting was held, and which at that time had been converted into a hospital.

The Secretary was instructed to send cordial greetings by telegraph to the State Medical Association, then in session in Pittsburgh, and to the Ohio Pharmaceutical Association, in session in Toledo.

Three sessions were held on Wednesday, June 11, during which the remaining special committees presented their reports. Bedford Springs was selected as the place for holding the next meeting, either on the second or third Tuesday of June, 1891, the day to be fixed by the Executive Committee, so as not to conflict with the time of meeting of the State Medical Association.

The recommendations contained in the President's address came up for consideration on the report of the special committee, and it was decided that the code of ethics be not changed; that the Committee on Legislation and Trade Interests be hereafter replaced by two committees, one on legislation and one on commercial interests, the latter to consist of seven members and to have charge of all matters relating to the commercial part of pharmacy; the legislative committee was requested to endeavor to effect the repeal of special laws still in force in some sections of the state and rendering some of the provisions of the pharmacy law unequal in application in different parts of the state; the Chairman of the Committee on Queries was requested to make special efforts to interest the younger members of the association in the investigation of pharmaceutical subjects and the preparation of papers for the annual meetings; it was also decided that during the reading of papers ordinary business be suspended.

Amendments to Chapter II of the By-laws were adopted, requiring the Treasurer to render a statement of account to members two years in arrears with their annual dues, preceding their suspension; also, that the charge for certificate of membership hereafter be $1 instead of $3.

A letter from Mr. Hallberg was read, giving information of the formation, by the American Medical Association, of a section on materia medica and pharmacy; the appointment of a committee of three was directed, with the view of participating in the labors of that section, if admissible.

Mr. J. Crawford, of Philadelphia, had sent an herbarium of mostly medicinal plants collected by him in the eastern section of Pennsylvania. This was exhibited to the meeting by Prof. Maisch, who also showed, on behalf of Mr. Kilmer, of New Jersey, specimens of a locoweed coming from Arizona, and stated that this specimen was not identical with Astragalus mollissimus, the most widely diffused locoweed of the West; that it was a leguminous plant and apparently belonged to the genus oxytropis. However, a closer examination subsequently made, showed the plant to be most likely an astragalus, section phaca, the species being not determinable without the fruit.

The report by Prof. Trimble on *adulterations and deteriorations* created considerable discussion, resulting in the passing of a resolution offered by Dr. Lowe, that $250 be appropriated for the purpose of preparing legal evidence in cases of adulteration.

Two of the papers read during the sessions appear in full in the present issue, entitled "The Botanical Origin of some Pharmacopœial Drugs" and "Notes on some North American Medicinal Plants."

A query relating to the preservation of *concentrated infusions* was answered verbally by Mr. Lemberger, who had found 12 per cent. of alcohol to be sufficient for several concentrated infusions, which are to be diluted with water

when dispensed. A question as to the use of *compound infusion of gentian* elicited the information that its use is rather local, apparently confined to the section of Pennsylvania east of the Alleghenies, and that in some localities, particularly in the western section of the state, it is very rarely prescribed.

The use of cottonseed oil for preparing *cold cream* was the subject of a paper by W. L. Cliffe. The following formula is given in parts by weight and in approximately definite weights: Cotton seed oil, 500 parts (15 oz.); spermaceti, 120 parts (3½ oz.); white wax, 120 parts (3½ oz.); oil of lavendar flowers, 1 part (12 drops); rose water, 259 parts (7 oz). Cotton seed oil being somewhat of a drying nature, it was questioned whether it was as well adapted for cold cream as the non-drying almond oil. Attention was called to the fact that the expressed oils of peach and apricot kernels are sometimes sold as almond oil, and that they are closely analogous to the latter, but may be distinguished from it by producing a reddish color on being warmed with diluted nitric acid.

Cascara Cordial. The following formula was furnished by Mr. J. H. Redsecker: Prepare an elixir from aromatic spirit (Nat. Formulary) 4 fl. oz.; syrup, 8 fl. oz.; orange flower water, and water, of each 2 fl. oz. Mix, filter through talcum, and to 12 fl. oz. of the filtrate add 4 fl. oz. of tasteless fluid extract of cascara sagrada (prepared with the aid of magnesia). The preparation is a pleasant and efficient laxative. The question being asked whether the extract made with magnesia would not lose its purgative properties, a conclusive answer could apparently not be given.

Comparative test of pepsins was the title of a paper read by Mr. W. L. Turner. The author procured six brands of pepsin and digested 15 milligrams of each for seven hours at a temperature of 105° F. With 80 gm. of hard-boiled albumen previously passed through a No. 30 wire sieve, with 100 cc. of a 1 per cent. diluted hydrochloric acid. After setting aside for ten hours the liquid was filtered from the undissolved albumen and the amount of dissolved peptone was obtained by evaporation and drying. It was ascertained that 100 parts of dried albumen would yield 214 parts of dried peptone, and upon this basis was calculated the proportion of albumen dissolved, and the real value of each brand as compared with the price of the one having yielded the best results, which was Lehn and Fink's scale pepsin (No. 2 of the following table):

No. 1	Digested	1833	Parts	Albumen.	Cost	$1.25	Pr.	oz.	Value	$0.96
" 2	"	1930	"	"	"	1.00	"	"	"	1.00
" 3	"	1793	"	"	"	.75	"	"	"	.93
" 4	"	1485	"	"	"	1.25	"	"	"	.70
" 5	"	1071	"	"	"	1.40	"	"	"	.61
" 6	"	966	"	"	"	.50	"	"	"	.53

Syrup of Citric Acid, U. S. P., changing in odor and taste when kept on hand, Mr. J. W. Landis recommended it to be prepared extemporaneously, by mixing simple syrup with the requisite amount of concentrated solution of citric acid and of spirit of lemon; the citric acid solution is to be kept in small vials in a cool place. This method is frequently followed, particularly for lemon syrup used for soda water.

The Production of Oil of Pennyroyal was discussed in a paper by Mr. J. F. Patton. The oil is distilled in Virginia, North Carolina, Missouri, Illinois and more extensively in Southern and Eastern Ohio. Guernsey Co., O., has

produced in one season 3,000 lbs., but last year the product was less than 100 lbs. During the discussion it was stated that variable quantities of the oil were also distilled in Pennsylvania and New Jersey. In a letter read it was stated that the plant could not be cultivated from the seed. This was explained as probably referring to the possible difficulty of raising the plant from seed in rich soil, since it was confined to sandy localities and poor soil. It was, however, stated that westward it grows in all kinds of soil, though in damp and rich ground it is, perhaps, less strongly odorous than in drier and more sandy situations. The fresh herb was stated to yield from 20 to 25 pounds of oil to the ton.

The proportion of proprietary preparations and ready-packeted articles purchased by pharmacists was the theme of an interesting and suggestive paper read by Mr. M. N. Kline. The purchases, for a period of three months, of five pharmacists in five large cities of Pennsylvania east of the Allegheny Mountains and outside of Philadelphia, were found to be as follows :

1.	Total	$1,021.85,	including	pat.	and	propr.	art.	$641.87	or 64 %	packeted	$6.00 or 6–10 %
2.	"	556.57	"	"	"			301.17	" 56 %	"	6.10 " 1 %
3.	"	887.25	"	"	"			598.25	" 66 %	"	7.69 " 1 %
4.	"	516.81	"	"	"			374.16	" 73 %	"	0.35
5.	"	816.30	"	"	"			645.05	" 80 %	"	5.90 " 3-4 %
		$3,798.78						$2,560.50	67 %		$26.04 2–3 %

Arranged in a like manner, 1,125 consecutive wholesale orders gave total $33,538.94, with $19,873.74 or 59 per cent. pat. and prop. art., and $285.27 or 8–10 per cent. packeted goods.

Another 100 consecutive orders represented a total value of $3,192.35, of which sum $1,730.10 or 54 per cent. for patent and proprietary articles including $132.36 or 4 per cent. pharmaceutical proprietary articles sold under the name of the makers, and protected synthetical preparations. There were in addition $183.30, or 6 per cent. various galenical preparations, and $23.11, or 7–10 per cent. packeted goods, like pressed herbs, etc.

In the entire number of these orders two only were found which contained no proprietaries and no packeted articles.

Several other papers were read, of which abstracts cannot well be given. One relating to the *enforcement of the Pharmacy Act* caused an animated discussion, eliciting the fact that nearly all complaints of violations that had been lodged with the Pharmaceutical Examining Board were either not accompanied by the requisite proof or could not be substantiated.

After the adjournment of the fourth session on Wednesday afternoon, the visitors were invited to a drive through the principal streets of the city and to the residence of Mr. George Small, from where a magnificent view was had of the city, the country surrounding York and the valley watered by Codorus Creek. The fifth session was then prolonged until near midnight, and when the business before the meeting was finished, and hearty votes of thanks for all the courtesies received had been passed, the Association adjourned finally, and on Thursday morning the visitors, local members and other excursionists took a special train for Gettysburg, where, under the guidance of Captain Long, the famous battle field was visited, with its numerous monuments which now mark the different spots that witnessed the memorable struggles in July, 1863.

EDITORIALS.

The German Pharmacopœia. — We learn from the "Pharmaceutische Zeitung" of June 18, that the Federal Council of Germany has ordered the new "Arzneibuch" to be printed, and to become obligatory from January 1, 1891. It will be issued in the German language with only the titles of the medicaments in Latin.

Early in 1887 a commission was appointed by the Chancellor, charged with collecting, arranging and critically examining the material for the new work. The preliminary labors were so far completed by the middle of 1888 that the material could be handed over to the special committees of apothecaries, chemists and pharmacognosists. Not less than 1240 new articles had been recommended for adoption; however, only a small number was finally selected. The labors of the special committees were considered by the sub-committees at meetings held June 12 to 19, 1889, when it was found that the changes considered necessary were so numerous that, instead of issuing an appendix to the second edition, the elaboration of a new third edition of the Pharmacopœia was deemed advisable, and received the sanction of the imperial health office. The final deliberations took place October 11 to 19, 1889, when the general commission met, in conjunction with health officers, military commissioners and veterinary surgeons detailed for this service. By resolution of the Federal Council of November 21, 1889, the text of the Pharmacopœia was ordered to be drawn up in the German language, as stated above.

Of the fifty new articles the following are not contained in the present U. S. Pharmacopœia: Acetanilidum, Acidum trichloraceticum, Æther bromatus, Agaricinum, Albumen Ovi siccum, Amylenum hydratum, Antipyrinum, Capsulæ, Chininum tannicum, Chloralum formamidatum, Codeinum phosphoricum, Cuprum aluminatum, Emplastrum Cantharidum pro usu veterinario, Extractum Condurango fluidum, Homatropinum hydrobromicum, Hyoscinum hydrobromicum, Keratinum, Liquor Ferri albuminati, Mentholum, Naphthalinum, Naphtholum, Paraldehydum, Phenacetinum, Physostigminum sulfuricum, Resorcinum, Rotulæ Sacchari, Salolum, Sebum salicylatum, Semen Arecæ, Semen Strophanthi, Species diureticæ, Sulfonalum, Terpinum hydratum, Thallinum sulfuricum, Tinctura Strophanthi, Unguentum Acidi borici, and Vinum Condurango.

In addition to these the following general articles have been admitted: Electuariæ, Emplastra, Extracta fluida, Granula, Linimenta, Pastilli, Pilulæ, Styli caustici, Suppositoria and Tabulæ.

Fifty-eight articles have been dismissed, among them morphine sulphate, other morphine salts being employed in preference. Various changes have been made in nomenclature, and "Sirupus" is now the adopted spelling for syrups. The reagents, including the volumetric solutions, have been increased from 67 to 89. As might be expected, a number of changes have been made in the preparations retained from the preceding edition. The table of solubilities is discontinued. The tables of maximal doses and of specific gravity have been revised, and the list of synonyms has been considerably augmented.

Precautions against disease.—We are in receipt of a series of the precautionary circulars issued by the State Board of Health of Pennsylvania, and cheer-

fully comply with the request of stating that the Secretary, Dr. Benjamin Lee, Philadelphia, will forward them to any applicant on the receipt of a two-cent postage stamp. The circulars are enclosed in a substantial envelope, in which they can be preserved for reference in case of emergency. The circulars received relate to the care of infants, to school hygiene and to precautions against typhoid fever, scarlet fever, consumption and against contagious and infectious diseases in general.

REVIEWS AND BIBLIOGRAPHICAL NOTICES.

Bulletins of the U. S. Department of Agriculture. 1890.

We acknowledge the receipt of Bulletin No. 26, Division of Chemistry, containing a record of experiments in the production of sugar from sorghum, in 1889, in Iowa, New Jersey, Virginia, Louisiana, Maryland and Kansas. The author of the report is the chief chemist, H. W. Wiley.

Also, from the Division of Botany, the first number of the Contributions from the U. S. National Herbarium, containing lists of plants collected by Dr. Edward Palmer in different parts of Southern California, and the country adjacent thereto. The names of the species are usually accompanied by critical remarks. We learn that the National Herbarium has assumed such large proportions and is being so rapidly augmented by the botanical investigations which are being prosecuted, that it becomes important to have a medium through which the results of the investigations may be brought to the notice of botanists. These contributions are edited by Dr. George Vasey, the Chief of the Division of Botany.

Experimental Farms. Reports for 1889. Ottawa: 1890. pp. 152.

An annual report made to the Minister of Agriculture by the Director, Prof. Wm. Saunders, and accompanied by the reports of various officers of the different Canadian experimental farms.

Seventh Annual Report of the Board of Control of the State Agricultural Experiment Station at Amherst, Mass., 1889. Boston: 1890. pp. 333.

An annual report made by Dr. C. A. Goessmann to the Board of Control, and including the reports of the physiologist and of the various assistants.

Report of the Department of Health of the City of Chicago for the Year 1889. 8vo. pp. 140.

In addition to the matter usually found in such reports, the one before us contains, also, considerable statistical information, notably on labor and industry. The following will be of special interest to our readers: In 1889, there were in Chicago 71 firms engaged as wholesale druggists or manufacturers, employing 850 persons, of whom 175 were females. The number of firms engaged as retail druggists was 475, with 1,075 employés, of whom 25 were females. There were 1,650 medical firms, and with these 1,700 males and 50 females were connected. In addition, there were 90 veterinary surgeons.

Strophantus Hispidus, its natural history, chemistry and pharmacology. Part 1. Natural history and chemistry. By Thomas R. Fraser, M.D., etc., Professor of materia medica in the University of Edinburgh. pp. 75.

This essay is a most valuable contribution to the history of strophanthus as

a medicine. It is now twenty years since Professor Fraser published his first observations on the physiological action and the chemical constituents of the drug in question. Previous to that time the kombé was known as an African arrow poison, chiefly through the writings of missionaries and travellers in the Dark Continent. The substance of this information is contained in the essay before us, together with the results of recent investigations, notably the long-continued researches made by the author, or which were incited through the interesting facts ascertained by him. Accordingly, we find here, aside from the general historical introduction, a full account of the use of kombé as an arrow poison, a description of the arrows used by the different tribes with the poison, an excellent botanical description of the genus and of the particular species, including the morphology and histology of the different organs, and the chemical history of the principles present in the seeds, as well as in other parts of the plant. Besides in the seed, strophantin is also contained, though in much smaller quantity than in the former, in the comose appendage, the placenta, endocarp, pericarp, leaves and root, but not in the bark of either the branches or stem. The subject is handsomely illustrated by seven lithographic plates, showing the different kinds of arrows, the different parts of the plant in their natural appearance and their structure, and the crystals of strophantin and strophantidin, obtained under various conditions.

A manual of pharmaceutical testing for the man of business and his assistants, comprising simple instructions for the testing of the chemicals of the British Pharmacopœia, etc., with such materials and appliances as are in common use at the dispensing counter. By Bernard S. Proctor, F.I.C. Published at the offices of the *Chemist and Druggist*, London, and at Melbourne and Sydney. 1890. 12mo. pp. 176.

In our opinion, there will be scarcely any pharmacist who would not endorse the author's position on the important question of testing as expressed in the prefatory and introductory remarks to the little work now before us. "Every pharmacist," the author says, "should test his chemicals occasionally, to see that their quality is up to the required standard. To do this frequently, the tests must be the simplest, speediest and most inexpensive that may be devised. The tests should answer the question, Is the article fit for use? And having given an answer to this, it is in many cases of little moment whether or not the extent of deviation from standard be indicated. It is usually better and simpler to reject that which is faulty than to make an exact analysis and allow for its deficiencies. Absolute purity is a thing only theoretically attainable, and it is better to define within clear and reasonable limits what may be allowed in practice than to give definitions which, from being unnecessarily and impracticably stringent, become a dead letter. * * * It is assumed that the degree of accuracy which ought to be demanded in pharmaceutical testing is the same—neither more nor less than that accuracy which is demanded of the pharmacist in the performance of his dispensing and operative processes, and, in this view, good qualities of the usual pharmaceutical measures, weights and balances, if carefully used, give results of a satisfactory degree of accuracy for the practical valuation of remedial activity."

From the practical standpoint thus indicated the work is written. The preliminary chapter contains much useful information on processes and manipula-

tions which will be particularly appreciated by the student. The various articles are considered in alphabetical order; they include not only chemicals, but also certain galenicals and crude drugs, like hydrargyrum cum creta, unguentum hydrargyri, acacia, cetaceum, colocynthis, copaiba, guaiaci lignum, oleum olivæ, scammonium and others. The tests of the British Pharmacopœia are primarily considered, their critical value being briefly indicated, and such modifications or additional tests suggested as the author's rich experience deemed necessary. A distinction is made between such impurities which result from faulty manufacture and intentional adulterations. As a rule, the tests of the B. P. are stated to be sufficiently simple and satisfactory, but in many cases simpler methods of attaining the required indications are described. Examinations by means of the microscope are not included in the present work.

From the preceding remarks the value of the work becomes obvious, it is one which may be consulted on all occasions falling within its scope, when to all practical questions it will give practical answers devoid of theoretical considerations, but reliable in all the details. The useful work is presented by the publishers in an attractive and serviceable garb.

Universal Pharmakopöe.—Eine vergleichende Zusammenstellung der zur Zeit in Europa und Nord Amerika gültigen Pharmakopöen von Dr. Bruno Hirsch. Göttingen: Vandenhoeck & Ruprecht. 1890.

Universal Pharmacopœia.—A comprehensive comparison of the pharmacopœias at present in force in Europe and in North America.

In our last volume we have noticed somewhat in detail the merits of this valuable work, which is now complete with the appearance of copious index and the tables condensed from those appended to the various Pharmacopœias. Of the latter, one of the most instructive ones is that giving the maximal doses permitted by the different works, showing how uncertain a quantity a so-called maximal dose is in the opinion of different medical authorities, as will be seen from the following examples in which the lowest and highest maximal single doses are stated: carbolic acid, 0·045 and 0·10 gm.; aconitine, 0·001 and 0·005 gm.; atropine sulphate, 0·001 and 0·002 gm.; chloral hydrate, 2·0 and 5·6 gm.; alcoholic extract of nux vomica, 0·02 and 0·15 gm.; digitalis, 0·1 and 0·3 gm.; iodine, 0·01 and 0·05 gm.; morphine, 0·02 and 0·03 gm.; strychnine, 0·005 and 0·015 gm.; veratrine, 0·005 and 0·01 gm., etc. A reference to the U. S. P., on page 1104, may easily be erroneously construed; it is stated there that the British and U. S. Pharmacopœias divide the pound into 16 instead of into 12 ounces, and for the latter the metric value is given for 1 pound = 16 ounces troy. The apothecaries' weight recognized in this country has the same subdivisions as the Nuremberg medical weight, the ounce (troy) being equal to 31·103 gm., while the mercantile or avoirdupois pound is divided into 16 ounces of 28·350 gm.

Referring to our former notices of this meritorious work, we need to add merely that it has been carried to its completion in the exact and comprehensive manner in which it was begun, and that it deserves a prominent place among the works of reference relating to pharmacopœial matters and to medicines in general.

VARIETIES.

SOZOÏODOL IN RHINOLOGY AND LARYNGOLOGY.—In a thesis on this subject, Dr. Stern gives the therapeutical indications for this new product. He is inclined to believe that its action depends upon the grouping of the component atoms. Sozoïodol possesses the advantage over iodol and iodine of being disengaged in the organism in its organic composition and not in the form of an iodurite. Furthermore, the action of the sozoïodols may be varied in their action by combining them with various metals. The following are the indications given by Stern for the employment of the various preparations of sozoïodol in diseases of the nose and larynx:

(1) *Sozoïodol of sodium*, readily soluble. Indicated in all cases where it is desired to obtain a general antisepsis rather than a local antiseptic action. It is also used in all cases where aqueous solutions are employed.

(2) *Sozoïodol of potassium*, sparingly soluble. It diminishes the secretions and acts as a desiccant—it is therefore indicated in eczema. It is usually employed with talc in the proportion 1–5 or 1–6.

(3) *Sozoïodol of zinc* acts locally as an irritant in solutions of from 1–20 to 1–50, and as a caustic in a solution of 1–5.

(4) *Sozoïodol of mercury* acts locally as a caustic, even in a solution of 1–10. Miller affirms that a solution of 2½ parts in 100 of this solution kills the acarus in 24 minutes.

Good results have been obtained in atrophic nasal catarrh (sozoïodol of zinc 1 part, talc 10 parts), in hypertrophic rhinitis and rhinopharyngitis (sozoïodol of zinc 1 part, talc 12 parts); good effects have also been obtained in tubercular ulceration of the pharynx and larynx, and in syphilis of the nose and larynx (zinc salt 1–12, or mercuric salt 1–20). The sozoïodol should be used in the form of powder, unguent, etc. Where use is made of aqueous solutions the sodium salt should be used.—*L'Union Méd.; Jour. Amer. Med. Assoc.*, May 24, 1890. See also AMER. JOUR. PHARMACY, 1888, p. 621, and 1889, p. 17.

The Antiseptic Power of Coffee.—Dr. Lüderitz has recently made a number of observations on the destructive power of coffee upon various microbes. He found that the organisms all died in a longer or shorter period—*e. g.*, in one series of experiments anthrax bacilli were destroyed in three hours, anthrax spores in four weeks, cholera bacilli in four hours, and the streptococcus of erysipelas in one day. It was, however, remarkable that good coffee and bad coffee produced precisely similar effects. He believes that, as previous observers have suggested, the antiseptic effect of coffee does not depend on the caffeine it contains, but on the empyreumatic oils developed by roasting.—*Jour. Am. Med. Assoc.*, May 10.

Iodoform emulsion has been much employed as a local antiseptic and an antituberculous remedy by Prof. Billroth and others. For preparing the emulsion, finely-powdered iodoform is suspended either in a mixture of almond and castor oils, or in olive oil and glycerin, or in glycerin alone. Moorhof's formula directs iodoform 50, glycerin 40, distilled water 10, and tragacanth 0·30. Billroth found a 10 per cent. emulsion serviceable, and Jasinski injected 180 gm. of a 10 per cent. emulsion at once without observing any toxic symptoms.—*Jour. Amer. Med. Assoc.*, June 10, pp. 873, 874.

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THE AMERICAN
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AUGUST, 1890.

DETONATION OF TABLETS COMPOSED OF CHLORATE OF POTASSIUM AND CHLORIDE OF AMMONIUM.

By Charles Bullock.

The mixture of the above mentioned salts, which has been in use for some time as a popular remedy for mouth and throat affections, has been viewed with suspicion, as a probable source of mischief on account of the decomposition resulting between them.

After a few weeks, chlorine compounds are evolved, noticeable by the odor, and by the effect on the organic material which may be in contact with or near them.

If the quantity of the tablets is large, sufficient heat may be generated to cause spontaneous combustion, should circumstances favor it.

We had a new experience with them, a few days since. A lot of the tablets, more than a year old, were removed from the small bottles in which they are usually put up, and four ounces of them placed in one bottle and finished for delivery. While standing undisturbed, a loud explosion occurred, and the bottle containing the tablets was almost pulverized—the concussion breaking several other bottles in proximity, although they were protected by paste-board cases.

The cause of the detonation may be looked for in the formation of chloride of nitrogen, as one of the resultants of decomposition between the salts. This experience determined us to deposit the remainder of our stock of the tablets in the Delaware River for *safe* keeping!

RESIN OF PODOPHYLLUM AND PODOPHYLLIN.

J. U. Lloyd.

(Continued from p. 245.)

The Name.—In early contributions 1844 and 1846, concerning plant products employed in his practice under the name Eclectic preparations,[1] Prof. John King first, as before stated (see p. 242) described the substance now known as resin of podophyllum. He affixed the term *resin*, to this as well as to other similar bodies therein mentioned, obtained by evaporation of an alcoholic tincture and precipitation in water, specifying such American drugs as Cimicifuga racemosa, Iris versicolor, etc. Prof. King, however, a practitioner of medicine, was not in position to place such substances before the profession, and this by his solicitation with resin of podophyllum was accomplished by the late W. S. Merrell of Cincinnati, a fact supported by Prof. King[2] as well as by unwritten information at my command.

During the considerable period that intervened between its discovery (1835) and its practical introduction (1846) as a remedy, the only name applied to it in journal communications had been "resin of podophyllum," which, as before shown, originated with King[3]. However, upon placing the drug before the Eclectic medical profession shortly after 1846, in which school it was almost exclusively employed until some years afterward, Mr. Merrell affixed to this substance the term *podophyllin*, which was unquestionably the first application of the word to a commercial drug, and thus he was the promulgator of the term as affixed to a medicine. The drug sprung rapidly into popularity, and its commercial name was so firmly established upon the appearance of King's Dispensatory in 1852, that the term podophyllin was made the principal title for this substance, but Prof. King, in the text descriptive of the root *podophyllum* still referred to it as a "resin to which the name of *podophyllin* has been given."[4]

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[1] *Philosophical Medical Journal*, of New York, 1844, vol. i, p. 1600, and the Western Medical Reformed, April, 1846.

[2] Discovery of Podophyllin, by J. King, M.D., College Journal of Medical Science, Dec., 1857, p. 55.

[3] Preceding 1846 there had been, so far as I can find, no record in regular medicine of such a substance.

[4] Eclectic Dispensatory, 1852, King and Newton, p. 313.

Mr. Merrell, however, did not originate the term as some have supposed, neither is it of Eclectic origin as the majority have accepted. Upon the contrary, my investigations indicate that the word *podophyllin* was devised by no less authority than the authors of the United States Dispensatory, and in connection therewith, we are thrown back to the original investigation of podophyllum.

When Mr. Hodgson (1832)[1] searched for the purgative principle of podophyllum, obtaining by a tedious method "pale brown scales of considerable lustre," which he inferred might dominate the drug, he refrained from affixing thereto a name. Our present knowledge of the nature of the mixture of partly resinous substances that carry the therapeutical force of the drug is evidence, conclusive perhaps, that Mr. Hodgson's search of the decoction of podophyllum root was mainly fruitless and could not have resulted satisfactorily. Even the use of lime in his second experiment, which resulted in the solution of considerable disorganized resinous bodies was counteracted by their subsequent precipitation with sulphate of zinc, the clear aqueous solution obtained thereby being practically destitute of the substances now accepted as characteristic of the drug. Notwithstanding, since the work of Mr. Hodgson, was the only recorded investigation that had been made,[2] the authors of the United States Dispensatory gave it considerable prominence in their first edition (1833), and added thereto, "Should it be found to be the purgative principle of the plant, it would be entitled to the name *podophyllin*."[3] I can find no previous record of such a word, and the high standing and careful work of the authors of the United States Dispensatory render it conclusive in my mind that they created the term, for had they borrowed it, credit and reference would surely have been extended the originator. Thus, it was that when through the therapeutical investigations of Prof. King corroborated by those of his associates, Prof. T. V. Morrow, Prof. Hill and others, the fact was demonstrated that this resin-like precipitate possessed the cathartic qualities of the root in an intensified degree,

[1] Paper read before the Phila. College of Pharmacy, November, 1831, published in the AM. JOURNAL OF PHARMACY, January, 1832, p. 273.

[2] Rafinesque, 1830, Medical Flora or Manual of the Medical Botany of the United States, vol. 2, p. 60, states: "It contains resin, fecula, bitter extractive, gallic acid, and a gummy substance."

[3] Italicized in the original.

Mr. Merrell naturally accepted the word that had been previously devised by the authors of the work that was considered an unquestionable standard.

From this research it is evident to the writer:

(1) That the name *podophyllin* was devised by the authors of the United States Dispensatory, and originally employed in 1833. It was used qualitatively by them in connection with a substance that did not prove to be the purgative principle of the drug, they distinctly saying, "Should it be found to be the purgative principle of the plant, it would be entitled to the name *podophyllin.*"

(2) Upon the discovery of the active cathartic resinous precipitate (1830), Prof. King had previously called it "Resin of Podophyllum."

(3) Upon introducing the drug into commerce, the suggestion of Wood & Bache was accepted by Mr. Wm. S. Merrell and the shorter name *podophyllin* affixed thereto.

[*To be continued.*]

GLYCYRRHIZA LEPIDOTA (*Nuttall.*)

By Madison L. McCullough, Ph.G.

From an Inaugural Essay.

In Gray's Manual, 6th edition, and in Coulter's Rocky Mountain Botany, the following habitat is given for this plant: Minnesota to Iowa, Missouri, Colorado and New Mexico, westward into Nevada and Northern California, and northward to Washington, and across the continent to Hudson's Bay. A statement found in some works that it grows near St. Louis, Mo., could not be verified by a botanist of that vicinity. Good specimens of the plant were secured from Deerlodge City, Montana, in which locality it grows to a considerable extent; but it does not appear to be used medicinally there. The stem is herbaceous; the younger branches are purplish-green and somewhat pubescent; the impari-pinnate leaves have about 17 oblong-lanceolate and acute leaflets; the whitish flowers are in pedunculate spikes; the compressed legume is beset with hooked prickles and contains from 2 to 6 seeds. The root was not sent, but the long and slender rhizome was received and examined. It is from ⅛ to ½ inch in diameter; the older portions are longitudinally wrinkled, of a dark brown color, and closely resemble the

rhizomes of the officinal species. The younger rhizomes are dull yellowish-brown and somewhat scaly. The fracture is short, the taste sweet, afterwards somewhat bitter. The bark is rather thick, and upon transverse section shows a light color and a number of rather wavy bast fibres. The yellow wood is divided into many narrow wedges by narrow medullary rays, the woodwedges being quite porous from numerous ducts, and internally terminate by one or two dark colored cells forming a circle surrounding the pith.

The older and more fully developed portions of the rhizome were selected for preparing glycyrrhizin, and parallel experiments were made with officinal liquorice root. The powder of the American drug was the lighter in color. The powder was exhausted with ammoniated water, the solution precipitated with sulphuric acid, the precipitate washed with cold water, dissolved in ammonia and again precipitated; this process was repeated for the third time, when the precipitate was dissolved in ammonia and the solution poured upon glass to scale. The ammoniated glycyrrhizin from the American plant had a somewhat bitter aftertaste. Equal weights of both products were then dissolved in ammonia, the glycyrrhizin precipitated by acid, and washed with cold water. By this operation the loss in weight of the product from the officinal drug was 21·87 per cent., and from the American plant 25 per cent. Comparing the results we have from

G. glabra, ammoniated glycyrrhizin 9·2 per cent., crude glycyrrhizin 7·18 per cent.
G. lepidota, " " 8·53 " " " 6·39 "

Washing the crude glycyrrhizins with diluted alcohol caused a loss in the former of 43 per cent., and in the latter of 50 per cent. of the weight. The latter also lost some of its color and sweet taste.

The result of this investigation of G. lepidota was unexpectedly large; judging by the taste not more than 1 or 2 per cent. of the crude ammoniated compound was expected to be obtainable. But the plant is sufficiently rich in the sweet principle to command notice.

Phenyl urethan results from the action of ethyl chloride upon aniline, and is a white crystalline powder, insoluble in water, but freely soluble in alcohol. Prof. Giacomini, of Turin (*Jour. de Méd. de Paris*), has found it possessed of marked antipyretic and analgesic properties, a dose of 0·5 gm. being equal in effect to 1 gm. of antipyrin. It is preferably administered dissolved in sherry wine, to prevent cyanosis and other unpleasant symptoms.

THE CRYSTALLINE PRINCIPLE OF PERSIMMON BARK.

By William Schleif, Jr., Ph.G.

Contribution from the Chemical Laboratory of the Philadelphia College of Pharmacy.—No. 76.

In this Journal, February, 1888, Mr. F. H. Murphy described a proximate analysis of the bark of the persimmon, *Diospyros virginiana;* he found among the usual constituents a peculiar crystalline principle. This appeared in the ethereal extract, and was in one instance obtained from ether in cubical masses, soft but crystalline; in subsequent experiments a granular mass resulted. The principle was soluble in alcohol, chloroform and ether, but insoluble in water. The object of this thesis is to more fully determine the characteristics of the compound.

Three samples of bark were taken: No. 1 was collected by myself during the spring in New Jersey; No. 2 was 5 pounds of a commercial sample, and No. 3 collected during the autumn in Southern Illinois. The different samples in No. 40 powder were completely exhausted with petroleum ether, the extract passing off with a yellow color, and leaving only a waxy residue on evaporation. The next treatment was with commercial ether, the extract having a deep wine red color in the case of Nos. 1 and 2 and a light yellow in the case of No. 3. The ether was recovered by distillation, and the remaining, crystalline, deep-red extract constituted the crude material from which the principle was prepared.

The following methods were used for its purification:

(1) The extract was repeatedly crystallized from ether. This yielded a light brown crystalline, soft substance, very bulky, but drying to a very small quantity if warmed on a water bath at 60° C., or over sulphuric acid at ordinary temperatures. The alcoholic solution was slightly precipitated by alcoholic solution of lead acetate, the precipitate being of a light brown color.

(2) The ethereal extract was dissolved in hot alcohol, in which it was completely soluble, and precipitated by alcoholic solution of lead acetate, which removed coloring matter, but did not affect the principle, which was separated from the filtrate by evaporation, after removal of the excess of lead by hydrogen sulphide.

The alcoholic solution still retained a red-brown color, but was much lighter than at first, it was repeatedly digested with animal

charcoal on a water bath, and recrystallized from alcohol until the solution became light yellow and the dry substance a light grayish-yellow color. The lead acetate precipitate after washing with alcohol, yielded nothing to hot alcohol or ether.

(3) The alcoholic solution of the ethereal extract was precipitated by lead acetate, filtered and the substance precipitated by throwing the filtrate into a large quantity of water. It separated with a brown color. The whole was then shaken with ether, the ethereal layer removed and evaporated.

This method necessitated further treatment with animal charcoal, and was not so satisfactory as No. 2, because of the smaller yield.

(4) The alcoholic solution was precipitated by admixture with water, the precipitate still retained considerable coloring matter. Both the precipitate, dissolved in alcohol, and the filtrate, which was transparent, but strongly opalescent, yielded precipitates with lead acetate. The second method, therefore, proved to be the more satisfactory.

Some of these crystals were 2 centimeters in length, the crystalline masses were dark red, soft and translucent, but completely lost their crystalline appearance on drying, no matter how carefully performed.

Alcoholic solution of lead acetate precipitated only coloring matter for the following reasons:

(1) The precipitate, when thoroughly freed from the adhering solution by washing with alcohol, yielded nothing to hot alcohol or ether and left a dark mass on drying, the original solution becoming considerably lighter by this precipitation.

(2) The method of simple recrystallization from ether gradually deprived the principle of color, its solution in alcohol producing a precipitate with alcoholic solution of lead acetate, which decreased in amount as the color became lighter.

(3) The alcoholic solution of the ethereal extract of the third specimen of bark was light yellow and was precipitated in a much smaller degree than the corresponding extracts of the other two specimens of bark, which were deep wine-red.

Physical Properties.—In the purest state I obtained it, the principle was in decidedly crystalline masses when obtained from ether or alcohol, soft and of waxy appearance when moist, drying to about

one-tenth of its previous volume, a complete loss of its crystalline structure accompanying this process.

The dried substance was granular, somewhat glistening, light brownish in color, of a peculiar odor and slightly astringent taste, soluble in alcohol, ether, chloroform, very slightly in water, insoluble in carbon disulphide and petroleum ether. Heated to 258° C. it darkened considerably, and at 262° C. it assumed the appearance of a deep red, decomposed fused mass.

Chemical Properties.—It had a neutral reaction, was not dissolved by boiling dilute hydrochloric acid or boiling dilute solution of potassium hydrate, and burned on platinum foil without leaving any residue. Its solution in alcohol was not precipitated by alcoholic solution of lead acetate or spirit of ammonia; a very slight darkening in color was produced by ferric chloride, or by a mixture of ferrous and ferric salt. It dissolved completely in glacial acetic acid on warming, a white precipitate being produced on dilution with water, but whether unchanged or as an acetyl compound was not determined. Eighty per cent. acetic acid dissolved it very slowly.

On heating the principle at 100° C. for one hour with dilute hydrochloric acid, filtering, neutralizing with potassium hydrate, shaking the clear filtrate with chloroform, and allowing the separated chloroform to evaporate, no residue except a slight one of potassium chloride, remained. A fruity odor was developed during the boiling.

Two ultimate analyses gave the following results:

	I.	II.
C,	67·44	67·10
H,	9·60	9·93
O,	22·96	22·97
	100·00	100·00

These figures indicate the formula $C_{39}H_{67}O_{10}$. The principle gave no evidence of the presence of nitrogen, and in solubility and general properties is more closely related to the resins than to any other class of plant compounds.

Papain has been found of great use in cleansing the middle ear, especially after the formation of caseous material, which is liquefied by keeping it in contact for about an hour with 15 minims of a 5 per cent. solution of papain in water, made alkaline by sodium bicarbonate. The ear is afterward syringed with a solution of boric acid.—*Edin. Med. Jour.*, Jan. 1890.

TURPENTINE.[1]

By Emmett Leroy Murray, Ph.G.

To obtain turpentine the tree is "boxed" or incised about a foot above ground to the extent of 7 in. deep, 3 in. wide and 13 in. across face. The best season for boxing is from Nov. 15th to March 1st, as the sap does not run during this time. The next step is that of "chipping" the tree with an instrument known as the "hack," which consists of a curved blade made of best steel, 2 in. wide and 2½ in. long, fixed into a handle from 1½ to 2 ft. long, weighted at the opposite end, the whole weighing about 20 pounds. The turpentine farm is divided into "crops" of 10,500 boxes each, worked by one man, who is required to go over his crop once a week and chip off ½ in. of sap wood and bark, so as to expose fresh surfaces, for at end of that time the turpentine almost ceases to exude. Trees are "chipped" only in summer season, from March 15th to Oct. 1st, as the turpentine flows only during warm weather. Once every four weeks the crop is to be gone over by a second man, whose business it is to transfer the turpentine collected in the boxes to barrels. This "dipping" is done with a flat heart-shaped steel attached to a four-foot handle. In September the turpentine adhering to the face of the trees, and which has not run into the boxes is removed. This product is distinguished as "Opaque," and amounts to about 25,000 lbs. to each crop yearly. The collected turpentine is transferred to stills made of copper $\frac{1}{16}$ to $\frac{1}{8}$ in. thick, and holding from 10 to 16 barrels of crude. In Willcox County the still is bricked in over a large furnace, which is level with the ground. To the cap (or neck) of the still is attached a condensing worm 100 ft. in length, making six curls in a large tank of cold water, at bottom of which is an exit for the distillate. The barrels of crude are taken, by means of skids, to the second story, and when the still cap is removed, the head fastenings of a number of barrels are loosened and contents emptied into the still. To prevent unnecessary wastage, these barrels are then inverted over a trough to drain. If the still contains "virgin turpentine" (or that collected from first year's chipping), less heat is required to complete the operation, but when "yearling turpentine" (or that col-

[1] Mr. Murray's inaugural essay, of which an abstract is here given, supplements, to some extent, the information given by Mr. Dunwody (see June number, p. 284).—Editor.

lected from second, third and fourth year's chipping) is used, the heat must be increased. This distinction is due to the latter being more dense and containing more resin than oil in proportion; therefore, the yield of oil is not so great. During distillation, water, in quantities of 8 to 16 gallons to each barrel of crude, is gradually added through a small funnel arranged in the cap. This prevents the turpentine from scorching, besides clarifies the resin and improves its quality. When the turpentine is exhausted of oil, the cap is removed and the contents of the still are agitated for a while; at length the gate at the bottom is opened and the mixture of resin and impurities, such as small chips, bark, etc., flows out upon sieves arranged in tiers over a large trough, from which the melted resin is transferred to barrels, made of rough material, for when the resin once becomes solid, it requires but little stave support. The chips, etc., are removed from the sieves and burned.

The following is a brief summary of facts, which may be of interest:

Three hundred boxes yield 1 barrel crude.

Five barrels crude yield 1 barrel oil (spirits).

Five barrels crude yield 3 barrels resin.

Resin from first year's yield is classed in commerce as W. W. (water white) and W. G. (window glass). Resin from second year's yield is classed as N, M, K, etc.

Oil (spirit) barrels are made to hold 50 gallons. The oil varies in price from 30–50 cents per gallon. Resin barrels usually hold about 280 lbs.; it varies in price from $1 to $3 per barrel.

GLEANINGS IN MATERIA MEDICA.

By John M. Maisch.

Delphinium Staphisagria.—The seeds were analyzed by Charalampi Kara-Stojanow (Inaugural-Dissertation, Dorpat). *Delphinine* and *delphisine* have the same composition, $C_{31}H_{49}NO_7$, crystallize from their solutions in ether and petroleum benzin, the form of crystals being alike; their melting points are almost identical (191° and 189° C). They give no color reactions and dissolve freely in chloroform. Greater differences were observed in their behavior to water, alcohol, ether and benzol. Delphinine has an acrid and benumbing taste, while the taste of delphisine in alcoholic solution

is bitter, a burning sensation being left on the tongue. *Delphinoidine* is amorphous, melts at 152° C., has a bitter, scarcely acrid taste, is soluble in ether, and yields amorphous salts, which are soluble in water. The mixture of alkaloids insoluble in ether, which has been known as *staphisagrine*, was found to consist of at least four alkaloids, all of which are amorphous and have a bitter taste. The physiological action of the different alkaloids was determined by Prof. Kobert; they do not enlarge the pupil, but otherwise resemble aconitine in their action, though decidedly weaker than the latter alkaloid, and differing more or less among themselves. The closest relation to aconite is shown by delphinine, but the lethal dose for cats and dogs is 1·5 and 0·7 mgm. respectively for the two crystalline delphinium alkaloids. Delphinoidine has a more decided narcotic action, the lethal dose being 5 mgm.

Japanese aconite, called kusa-uzu.—These tubers, the botanical origin of which has not been satisfactorily established, was examined by Arthur Lubbe (Inaugural-Dissertation, Dorpat, 1890). The crystallized alkaloid, purified by repeated recrystallization, was found to be free from bitter taste, to melt at about 184° C., and to not give any characteristic color reaction. It is identical with aconitine, and has the formula $C_{33}H_{44}NO_{12}$. The hydro-bromide and chloride yield again the same base unaltered. Physiological experiments made with this alkaloid also showed its identity with that obtained from *Ac. Napellus*. It was observed that it passes, to some extent, into the saliva unaltered. The presence of pseudaconitine could not be established; but, besides the crystalline aconitine, at least two amorphous bases, having a bitter taste, were recognized.

Japanese aconite, called Shirakawa-Bushi.—Dr. O. Lezius examined these tubers (Inaugural-Dissertation, Dorpat, 1890), which agreed in appearance and structure with the drug described by Langgaard (see Proceedings Amer. Phar. Assoc., 1881, p. 179) under the name of Shirakawa-uzu. In Japan, the parent tubers of aconite are usually distinguished as *uzu*, from the secondary tubers which are designated *bushi*. The tubers examined are, therefore, most likely mainly these latter tubers, presumably of *Aconitum chinense*. Besides two amorphous bases, which were not further examined, 0·02 per cent. of crystallized alkaloid was isolated in the pure state and chiefly used for physiological investigations, which were identical in their

results with those produced by aconitine from *Ac. Napellus*. The identity of these two alkaloids was corroborated by the acrid, not bitter, taste; by the melting point (180·9° C.); by the absence of color reactions; by the rhombic plates of the hydriodide, etc. The small yield of aconitine is undoubtedly due to the fact that the tubers had been preserved by salting them.

The alkaloids of Corydalis cava have been studied by Fr. Adermann (Inaugural Dissertation, Dorpat, 1890) who ascertained that the alkaloid previously described as *corydaline* consists of three or four distinct alkaloids, one of which has properties and composition closely analogous to *hydroberberine*. It forms colorless crystals which, in contact with light, turn yellow, are freely soluble in chloroform and benzol, and dissolve in 1 part of strong alcohol, in 28 p. ether, sp. gr. 0·782, in 35 p. absolute ether, in 320 p. petroleum benzin, and in 4792 p. water. It has the composition $C_{20}H_{23}NO_4$, melts at 138° C., and has no characteristic color reactions. Fröhde's reagent colors transiently green, and most oxidizing agents produce a yellowish-red color. On boiling the alcoholic solution it turns yellow, and then contains *berberine*, which is also produced by careful treatment of the solution with chromic acid. Berberine is present in notable proportion in the chloroform solution of the crude alkaloids, and since the fresh tuber has a yellow color, this alkaloid doubtless exists ready formed in the plant, and more of it is likely to be produced during the process of isolating the hydroberberine-like alkaloid. An alkaloid for which the author proposes to retain the name *corydaline*, crystallizes in long, soft needles of a silky lustre, turning grayish-green in contact with light and with alkalies. Its composition agrees with the formula $C_{22}H_{21}NO_4$. The alkaloid, like the first one, is somewhat dextro-rotatory. Corydaline requires for solution 198 p. ether, 338 p. absolute ether, 150 p. strong alcohol, 45·5 p. benzol and 7064 p. water. The salts are intensely bitter and crystallize readily. Sulphuric acid colors yellowish, changing to a splendid violet. Violet colors are also produced by Fröhde's reagent, by selenosulphuric acid, and by sulphuric acid containing nitrate or chromate; the latter reaction resembles that with strychnine, but the color is more of a reddish tint and disappears more rapidly. *Fumarine* shows similar behavior, and is probably closely related to corydaline. The amorphous base was present in the tuber only in small quantity, and its purity could not be established.

Sulphuric acid, with the addition of a little nitrate generated the odor of bitter almonds.

Ephedra monostachya, Linné.—This shrub is used in Southern Siberia as a popular remedy in gout and syphilis, a decoction of the branches and root being employed, while the pseudo-fruit, containing 13·89 per cent. sugar, either candied or its gelatinous juice, are esteemed in pectoral complaints. The stem attains a height of about two feet and has numerous round, warty and forking branches resembling equisetum; the dividing points are knotty and bear quite small, membranous, sheathing and 2 or 4-parted leaves which, on drying, become easily detached. The root consists of a tuberously enlarged main root sending out long, horizontal branches 2 inches thick, and like their descending branches, which have the size of a quill, twisted around their eccentric axis. The exfoliating bark of the root is tough, but the wood after drying is easily split in a radial direction into thin layers and may be rubbed to powder between the fingers. The inaugural dissertation of Paul Spehr (Dorpat, 1890), contains also a brief histological description of the stem and root. The former is free from starch, but the root contains a small quantity in some parts of the medullary rays. Tannin and pyrocatechin are present in the overground portion but not in the root. The latter yielded only a minute quantity of amorphous alkaloid, while from the branches 0·03 per cent. of pure crystallized alkaloid was isolated. Its composition corresponds to the formula $C_{13}H_{19}NO$. The pure alkaloid does not give any characteristic color reaction. It melts at 112° C., and its chlorhydrate at 207° C. The alkaloid is readily soluble in water and alcohol, is nearly insoluble in petroleum benzin, and requires 11 parts of chloroform, 1,180 parts of benzol, and about 100 parts of ether for solution; oxidation with permanganate yields benzoic acid. The taste is at first imperceptible, then becomes burning and benumbing. Professor Kobert observed it to exert toxic effects upon frogs, but doses of 0·2 gm. given to dogs and cats were almost without action. The alkaloid differs from ephedrine and pseudephedrine of *Ephedra vulgaris*, which have a bitter, astringent taste and a mydriatic and poisonous action.

Siberian cedar nuts, the seeds of Pinus Cembra, *Linné*, attain a length of 11 mm. and a width of 9 mm., are ovate in shape, irregularly and obtusely triangular, have a brown-reddish, hard and brittle

testa, a thin, brownish inner seed coat and a milk-white oily kernel. The large parenchyma cells of the endosperm contain roundish aleuron granules and minute starch grains. The elongated embryo terminates in about eleven narrow cotyledons, forming a head and enclosing the plumule. Analyzed by Professor E. Lehmann, of Tomsk)*Phar. Ztschr. f. Russl.*, 1890, pp. 257 and 273), the kernel weighing something over one-half of the seed, yielded 56 per cent. fixed oil, 6 per cent. albumin, 2·7 per cent sugar, 1·6 per cent. starch, 9 per cent. moisture, and 2·6 per cent. ash. The fat contains myristicin, but consists chiefly of an olein which is probably identical with linolein.

Adulterated Mace.—Dr. T. F. Hanausek received from Northern Germany a sample of mace which was adulterated with the arillus of another species of myristica, and agreed in nearly all respects with Bombay mace described by the author in 1887. The large cells contain a resinous body which dissolves in alcohol with a saffron yellow or almost greenish-yellow color. The addition of an alkali changes the color to red, and on acidulating the liquid the yellow color is restored. The test is best performed by rendering the alcoholic tincture of the material sufficiently alkaline that filtering paper impregnated with the liquid has an orange color, the paper is washed with water to remove excess of alkali, and a trace of an acid is now sufficient to produce a saffron-yellow spot. On examining a transverse section of a branch of Bombay mace, the cells near both surfaces are observed to be homogeneously filled with a golden-brown or lemon-yellow mass of oil and coloring matter, leaving the middle zone of the tissue of a white color. This nearly odorless and tasteless mace is probably derived from Myristica malabarica, *Lamarck.—Ztsch. f. Nahrungsm. Unters.*, 1890, 17.

CHEMICAL NOTES.

By Henry C. C. Maisch, Ph.G., Ph.D.

A new Alkaloid from the Root of Scopola atropoides.—E. Schmidt (Apoth. Zeit., 1890, v, 186) found that two substances which had been sent to him by Bender as hyoscine and hyoscine hydrobromide, and which had been prepared from 100 kg. of Scopola atropoides, differed from hyoscine as described by Ladenburg. The free alkaloid melts at 59° C.; on drying over sulphuric acid and then heating to 60° C., it lost over 5 per cent.; the gold double salt melts at

214° C. (Ladenburg, 198° C.), and an analysis yielded results corresponding to $C_{17}H_{21}NO_4$. The hydrobromide above referred to had the composition $C_{17}H_{21}NO_4HBr + 3H_2O$, and is the salt of the above alkaloid. Schütte found the same also in Atropa Belladonna, Duboisia myoporoides and Datura Stramonium.

Solanidine from Potato sprouts.—A. Jorissen and L. Grosjean (Bulletin de l'Acad. Belgique, 1890 (3), xix, 245) obtained from fresh sprouts, besides solanine and solaneine, which, on boiling with dilute mineral acids, yield solanidine, also the latter alkaloid. The fresh sprouts are treated in a closed vessel for some days with officinal ether. This is decanted, filtered, and the solvent recovered. The residue is treated with alcoholic potassium hydrate to saponify the oil, the soap dissolved with water, and the residue dissolved in hot alcohol. By repeated crystallization from alcohol and ether, the authors obtained pure solanidine. The fresh sprouts, containing 90 per cent. water, yield 1·5 per cent., but the dry no alkaloid extractible with ether. A new reaction for solanidine is the following: A solution of solanidine in glacial acetic acid is evaporated to dryness on a water bath in a porcelain dish; the residue, treated with concentrated hydrochloric acid and ferric chloride, turns yellow, and heated again until dry, it turns violet.

The composition of Digitonin.—The digitalin of commerce consists, according to Schmiedeberg, of digitoxin, digitonin, digitalin, and digitalein. Ludwig, Delffs, Walz and Kosmann found that on heating commercial digitalin with dilute acid a substance was obtained which reduces Fehling's test. Schmiedeberg made the same observation with his purified digitonin, and found also a body which is insoluble in water, which he named digitogenin. H. Kiliani (*Ber. d. Deutsch. chem. Gesell.*, 1890, 1555) made an investigation of a commercial digitalin which was almost completely soluble in water. The hydrolysis was carried on as follows: 1 pt. commercial amorphous digitalin was dissolved in 10 pts. water; then 1 pt. concentrated hydrochloric acid sp. gr. 1·19 was added and the solution heated on a water-bath for six hours. A precipitate is formed which is separated by filtration and washing with cold water. The soluble decomposition products are galactose and dextrose, and the insoluble one is the digitogenin of Schmiedeberg. The composition of the latter is very likely $C_{15}H_{24}O_3$, while digitonin is very likely $C_{27}H_{44}O_{13}$.

On Indian Oil of Geranium.—F. W. Semmler (*Ber. d. Deutsch. chem. Gesell.*, 1890, 1098) examined this oil as obtained from *Andropogon Schœnanthus* by Schimmel & Co. The properties were the same as those given by Beilstein (*Chemie*, iii, 265); the rotation in a 10 cm. tube was—20′. Fractional distillation in vacuum yielded as principal constituent (90 per cent.) *geraniol* $C_{10}H_{18}O$; the boiling point at 17 mm. pressure is 120·5–122·5°, and the refraction 48·71. Phosphorus pentoxide yields a terpene, boiling point 60–65° C. and a polyterpene, boiling point 205–210° C. Geraniol is undoubtedly an alcohol belonging to the series $C_n H_{2n} - {}_2O$.

GLEANINGS FROM THE GERMAN JOURNALS.

By Frank X. Moerk, Ph.G.

Russian peppermint oil was examined by Hugo Andres with the following results: The sample examined was obtained from the fresh herb, had a greenish-yellow color, specific gravity 0·915 at 15° C., and a rotary power $\alpha_D = -17{\cdot}13$. The portions obtained by distillation and congelation after fractional distillation had the following boiling points: 160–165°, 173–175°, 203–206° and 206–209°. The first fraction consisted of menthene $C_{10}H_{18}$ and a terpene. The second fraction showed the greatest optical activity; a terpene was separated which boiled at 176°, at 20° had the specific gravity 0·8571, and a rotary power of $\alpha_D = -41{\cdot}19$; it was identical with Wallach's *limonene*. The last two fractions consisted of mixtures of menthone $C_{10}H_{18}O$ (b. p. 206–208°) and menthol $C_{10}H_{20}O$ (b. p. 211° C.), the separation being effected as follows: 10 grams of the fractions (each one treated separately) were dissolved in 25 gms. alcohol, 8 gms. hydrochlorate of hydroxylamine, and a slight excess of sodium bicarbonate added, the mixture set aside for three days, then an excess of water added, the oily layer separated and agitated with 20 per cent. sulphuric acid, the undissolved oil (menthol) removed and the acid solution agitated with ether, the ethereal solution removed and the ether evaporated; dextrogyre menthoxim was here obtained, which by heating on a water-bath with dilute hydrochloric acid decomposed, yielding a clear oil (menthone) boiling at 206–208°, $\alpha_D = +8{\cdot}04$, and by analysis agreeing to formula $C_{10}H_{18}O$. In this method of separating menthone and menthol, the former unites with hydroxylamine, while the menthol does not.

Russian peppermint oil does not give an absorption spectrum of itself, but a mixture containing 10 cc. of the oil, 5 cc. glacial acetic acid and 5 cc. nitric acid will, after two minutes, show 2 bands, one in the red and the other in the orange part of the spectrum; after 5 minutes a third band is found in the green; after 20 minutes the three bands unite. The mixture viewed by transmitted light was green, after 5 minutes' standing a blood-red fluorescence was visible, and after 20 minutes the color by transmitted light had changed to a pure blue. These spectroscopic results do not show much difference from the English peppermint oil, but the several changes occur more quickly with the Russian oil.—*Pharm. Ztschr. f. Russland*, 1890, 341 and 357.

Medicinal Soaps.—Neutral fluid soaps are at present claiming considerable attention. A pamphlet of Dr. A. Gude & Co., of Leipzig, on the subject, contains the following information: *Iodine soap*, containing *free* iodine, deteriorates rapidly, and can be preserved only for 8 days. *Resorcin* must be incorporated in neutral soap only; *hydroxylamine* can only be preserved in acid soaps; in neutral or alkaline soaps there is constant decomposition, rendered visible by the evolution of gas. *Chrysarobin* is not soluble in neutral soap, but easily soluble in alkaline soaps. *Thiol*, *Peru balsam* and *tar* make permanent mixtures with fluid soaps. Soft neutral soaps of ointment-like consistence answer very well for insoluble substances like *sulphur*, which would separate from fluid soaps. In using neutral or excessive-fat soaps, hot water should be taken, so as to dissolve the soap and allow its removal from the skin. —*Pharm. Centralhalle*, 1890, 384.

Menthol-glycerin-cream, for the cleansing of teeth, is made by mixing 20 parts precipitated calcium carbonate, 10 parts powdered medicinal soap and 5 parts magnesium carbonate, with sufficient glycerin to form a soft mass, then coloring with carmine and flavoring with menthol.—(*Ind. Blätter*) *Pharm. Centralhalle*, 1890, 384.

Potassium tellurate is recommended by Dr. E. Neusser for the treatment of night sweats in pulmonary diseases; it is given in pill form in doses of 0·02 gm (⅓ grain), generally this dose is sufficient, but double the dose can be taken without any other disagreeable effect save the appearance of the tellurium-breath. (*Wr. Klin. Woch. Pharm. Post.*, 1890, 467.

Discoloration of Antipyrine.—Dr. Grüner has noticed that a

sample of antipyrine put up in a metal box had a decidedly *reddish yellow* color where the powder came in contact with the metal. Examination of the sample showed it to answer all tests of purity excepting the color. To prevent the discoloration the powder is recommended to be put in glass containers or transferred to such as soon as received by the apothecary.—*Oesterr. Ztschr. f. Pharm.*, 1890, 301.

Eugenol has been found by Pomeranz to be a constituent of oil of sassafras although in small quantity. From 3 kilos crude sassafras oil he obtained 7 grams of a phenol boiling at 246–247° having an eugenol like odor and which by analysis and conversion into the benzoyl-derivative was proven to be identical with the eugenol of the oil of cloves.—(*Monatsh. d. Chemie*) *Apotheker Ztg.*, 1890, 345.

Fluid glycerin-soap. 500 gm. olein, 100 gm. alcohol and 280 gm. potash lye (33⅓ per cent.) are placed in a flask and agitated frequently while warmed in a steam-bath for one-half hour, a solution of 50 gm. potassium carbonate in 100 gm. water is then added and the heating continued until a portion removed is perfectly soluble in water. The soap is next dissolved, with heat, in 1570 gm. glycerin, set aside for a few days in a cool place and filtered; the filtrate can be perfumed as desired.—*Pharm. Ztg.*, 1890, 386.

Antipyrine and sodium salicylate have frequently been noticed to liquefy if the powders had been intimately mixed and exposed to the atmosphere for a short time. Prof. Spica (in L' Orosi of May, 1890) finds the liquefaction possible only in moist air and to be attended by an increase in weight, and after careful experiments states that no chemical change takes place. The hygroscopic sodium salicylate by absorption of water enables the antipyrine to dissolve, the latter being more soluble than the sodium salicylate. He also gives a method for obtaining the true *antipyrine salicylate:* 100 parts antipyrine are dissolved in a rather large quantity of boiling water and 73·4 parts sodium salicylate added in small portions; on cooling the new chemical separates in crystals; they have the formula $C_{11}H_{12}N_2OC_7H_6O_3$.—*Pharm. Ztg.*, 1890, 386.

Salipyrine.—The publication of the above article has occasioned the announcement that J. D. Riedel, of Berlin, has applied for patents in various countries covering the manufacture of antipyrine salicylate, to be known as "Salipyrine" Riedel. The mode of preparation is not made public, but it is stated to be cheaply made, as

it is not necessary to use the expensive commercial articles. In addition to the method of Prof. Spica, it is possible to make this new compound (1) By heating in a steam-bath the molecular proportions of antipyrine and salicylic acid with or without a small quantity of water; after cooling, the solid mass is recrystallized from alcohol; (2) The antipyrine is dissolved in water, the salicylic acid in ether; after thorough agitation of the mixed solutions the salt separates out slowly, being only slightly soluble in either liquid; (3) Very pretty crystals can be obtained by dissolving the antipyrine in chloroform, the salicylic acid in ether and mixing the two, rather dilute, solutions. The salt made by the secret method has been made in large quantities, and the results of its use in hospitals have been very favorable. It forms a coarsely crystalline, white, odorless powder, of a sweetish not unpleasant taste; easily soluble in alcohol and benzol, difficultly soluble in ether and water (boiling water, 4·4:100; cold water, 0·4 : 100); it melts at 91·5° C. (Prof. Spica, 89–90°). Sulphuric acid liberates salicylic acid and sodium hydrate liberates antipyrine, allowing an easy determination of purity. A weighed quantity is dissolved in water in a separating funnel, a measured excess of $\frac{2}{n}$ sodium hydrate solution added and the separated antipyrine dissolved by agitating with chloroform; the chloroform solution is evaporated in a tared vessel, the antipyrine (42·3 per cent.) weighed and its purity further established by a melting point determination (should be 113°). The sodium salicylate solution is next titrated with sulphuric acid and the salicylic acid (57·7 per cent.) taken up with ether, the ethereal solution evaporated and a melting point determination made (should melt at 155° C).—Dr. L. Scholvien, *Pharm. Ztg.*, 1890, 395.

Potassium nitrate in potassium iodide is positively detected by the following test: By use of pure dilute hydrochloric acid and pure zinc an energetic evolution of hydrogen is started, after 8–10 minutes the solution of potassium iodide, to which some starch paste has been added, is introduced; no violet or blue color should be produced even after standing some time. The object in letting the hydrogen evolution proceed for some time before adding the potassium iodide is to change any free chlorine which may be present in the acid into hydrochloric acid.—Dr. Brenstein, *Pharm. Ztg.*, 1890, 400.

Croton oil and Croton-olic acid.—Professor Kobert and one of his scholars have finished an investigation deciding the question of the differences in croton oil and its action. (1) *Commercial croton oil*; (2) *acid croton oil*, the portion soluble in alcohol; (3) *neutral croton oil*, the portion only slightly soluble in alcohol, and (4) *pure croton-olic acid* were examined for their activity. The crotonolic acid was prepared by taking a strongly acid commercial oil, extracting the portion soluble in alcohol and treating this with an excess of hot-saturated solution of baryta for one-half hour on a water bath; the white mass formed is thoroughly washed with water to remove excess of baryta, coloring matter and salts of acetic, butyric and tiglic acids, drained, completely dried in a vacuum and extracted with ether. The barium salts of lauric, palmitic and stearic acids are insoluble, while those of oleic and crotonolic acids are soluble; the latter two salts are separated by evaporating the ether, treating the residue with absolute alcohol, which dissolves the crotonolate of barium only; on cautiously adding sulphuric acid, filtering and evaporating, croton-olic acid is obtained.

No definite solubility in absolute alcohol can be ascribed to croton oil, the solubility depending upon the age of the oil, *i. e.*, the presence of croton-olic acid, some samples of old oil containing no glyceride of croton-olic acid, but only the latter in the free state.

The activity of the samples disclosed the following: The *commercial* and *acid* oils as well as *croton-olic acid*, used in experiments upon animals, had less effect than upon the human being, but diarrhœa followed the use of the three samples. The *neutral* oil, the activity of which upon man was confirmed, failed to produce any effect upon animals. Experiments go to prove that the pancreatic ferment has the power of liberating croton-olic acid from the *neutral* oil. The introduction into the blood vessels of sodium carbonate emulsions of the commercial oil produced serious poisoning symptoms in quantity of 8 mg. to 1 kilo weight of the animal; *acid* croton oil was more poisonous, requiring less than 5 mg. for 1 kilo; and of croton-olic acid the lethal dose is less than 4 mg. for 1 kilo. Sodium croton-olates, obtained from acid or neutral oil, were identical; hence, the conclusion of Senier, that the alcohol soluble portion of croton oil represents a peculiar oil-modification, is no longer tenable.

Interesting is the fact that insane persons, like animals, are not

susceptible to the *neutral* oils, but form no exception when using the *acid* oil, showing that there is no decomposition of the glyceride into the free croton-olic acid. Croton-olic acid, administered in the form of keratin-coated pills, is rather uncertain in its action if in quantity less than 10 mg., above this dose the action was absolutely certain, but attended with such burning pains in the intestines as to prohibit its use. For human beings they claim only the *neutral oil* should be used.—E. von Hirscheydt (Kobert's Arbeiten, 1890, iv,) *Rpt. der Pharm.*, 1890, 173.

PRACTICAL NOTES FROM VARIOUS SOURCES.

By the Editor.

Inefficiency of Compressed Tablets.—The *Correspond. für Schweizer Aerzte* reports several cases in which compressed tablets containing antipyrin, and others of phenacetin, passed through the intestinal canal unaltered.

Administration of Bromoform.—Dr. Stepp found bromoform useful in whooping-cough, if administered pure, merely covered by water. The dose for children of three or four weeks is one drop, 3 or 4 times daily; older nursing children 3 drops according to the intensity of the attack; up to seven years of age 6 or 7 drops three or four times a day. The bromoform should be ordered only in small quantities, and should be protected from the light to prevent decomposition.

Administration of Menthol.—Dr. Gottschalk prescribes menthol 1·0, alcohol 20·0, water 150·0, and for vomiting of pregnancy orders one tablespoonful every hour.—*St. Petersb. Med. Woch.* See also April number, p. 208.

Administration of Carbon Disulphide.—In cases of dysentery, Dr. Jakobleff administers calomel in hourly doses of 0·06 to 0·12 gm., until calomel stools are produced, and during this time enemata are given twice daily, of carbon disulphide 0·1 in water 50·0 gm. For internal use the daily quantity is carbon disulphide 0·2 to 0·3 gm., given in half a tumblerful of water or milk, with a little peppermint. —*Jour. Am. Med. Assoc.*, June 14.

Otorrhœa Pellets.—Dr. Shield (*Practitioner*) uses pellets prepared of cacao butter suitably medicated. After inserting a pellet the patient is ordered to lie down with the affected ear uppermost, when

the pellet will melt and the liquid come into contact with the affected parts.

For softening ear-wax, La Clinique recommends a solution of boric acid 0·6 gm. in glycerin 15, and water 15 gm. The solution is warmed, and 5 to 10 drops of it are put into the ear twice a day.

Mercuric Collodion, as a remedy for warts, is prepared by Dr. Kaposi of mercuric chloride, 1 part, dissolved in flexible collodion, 30 parts. It is applied with a brush once daily to the wart and around its base.

Socin's antiseptic paste is prepared of zinc chloride 5, zinc oxide 50, and distilled water 50 parts. It is used as a dressing, dries rapidly, forms a strong layer, and this may be still strengthened by the incorporation of some cotton.—*Med Chir. Rundsch.*, May 15, 1890.

Elastic bougies, filled with mercury, have been found advantageous by Dr. L. Casper, their weight causing them to slip easily into the bladder.—*Therap. Monatsh.*, May, 1890.

Unguentum Chrysarobini, for use in piles, is directed by Dr. Kosobudski to be made of chrysarobin 0·5, iodoform 0·2, extr. belladonnæ 0·4, and petrolatum 15 gm., to be applied three or four times daily.

Suppositoria Chrysarobini, for internal piles, are ordered by the same author of chrysarobin 0·6, iodoform 0·2, extr. bellad. 0·1, and sufficient cacao butter for ten suppositories.—*Russk. Medits.*

Iodized Wine.—Wine completely covers the taste and caustic properties of iodine. This effect is usually ascribed to the presence of tannin, but Mr. H. Barnouvin has shown in 1885 (*Jour. de Phar. et de Chim.*) that this theory is not correct; for after removing the tannin by means of gelatin, the properties of iodine will still be completely covered if used in the proportion of 1 gm. to 1 liter of this wine. Mr. Barnouvin (*Bull. Gén. de Thérap.*, Febr., 1890, p. 128), in again directing attention to this fact, states that iodized wine may be prepared simply by the addition of an alcoholic solution of iodine to wine. Thus prepared without the addition of tannin, iodized wine has been employed with the most satisfactory results.

Naphthol-camphor is prepared from one part of beta-naphthol and two parts of camphor, the mixture forming a brownish transparent liquid. This is employed by Dr. Schwartz (*Wien. Mediz. Presse*,

Decbr., 1889) as a dressing for various ulcers, the application being renewed every day or two. It effects healthy granulation and cicatrization without producing toxic symptoms.

Antiseptic Mouth Wash.—A formula, published in *Therap. Monatsh.*, Febr., 1890, directs saccharin 1·0, sodium bicarbonate 0·5, and alcohol 100 gm., with 2 drops of oil of peppermint. For use add a teaspoonful to a small glassful of water.

Tincture of Helianthus annuus is stated by Dr. Maminoff to have given excellent results in the treatment of intermittent fever of children. It was prepared from the fresh flowers and bark of the plant, of the strength 1 : 5. The dose was 10 to 25 drops three or four times daily. The children took the medicine readily. No secondary effects were observed.—*Les Nouv. Remèdes*, 1890, p. 78.

Carbolated oil, prepared of carbolic acid 1 part, and olive oil 15 parts, is a very efficient remedy in itch, according to the experience of Dr. F. Trisilian.—*Les Nouv. Remèdes*, 1890, p. 225.

Administration of Naphthalin.—Owing to its insolubility in water and weak alcoholic liquids, Tichborne advises it to be dissolved in a fixed oil, and this solution to be converted into an emulsion in the usual manner. To obtain it in powder, naphthalin is best precipitated by pouring its solution in strong alcohol or acetic acid into cold water, collecting the precipitate, washing it well with water, and drying at a gentle heat.

SHORT METHODS FOR ASSAYING GALENICAL PREPARATIONS OF OPIUM,

AND A REVIEW OF FLÜCKIGER'S METHOD FOR OPIUM ASSAY COMPARED WITH SQUIBB'S AND STILLWELL'S.

By J. B. Nagelvoort.

"The presence of sugar makes the estimation of alkaloids more difficult."—*Dieterich and others.*

"To separate in one operation the whole of the morphine in a perfectly pure state is an impossibility."—*Digest of Criticisms on the U.S.P.*, 1890, III, p. 319.

Opium assays are always interesting, inasmuch as opium is one of our few reliable remedies, and inasmuch as a large amount of capital may be involved in morphine determinations. A successful experiment to shorten the time of assay is a benefit for the manufacturing

chemist as well as for the analyst. It is scientifically just as valuable to test recently-published methods as to devise new ones.

Before proceeding with the descriptive part of this article, the writer desires to state that he is indebted to Professor Flückiger's method for opium-assay, published in the *Archiv der Pharmacie*, 1889 (reproduced in this JOURNAL, 1890, p. 14), for the general principles of a process which yielded very satisfactory results when *properly* applied to various galenical preparations of opium; satisfactory to such an extent that the two important quotations heading this contribution will need revision. A series of experiments, given below, furnish evidence that the sugar contained in Vinegar of Opium, U.S.P., does not increase to any extent the difficulty of estimating its percentage of morphine, and that it is possible for the chemist to obtain satisfactorily, in one short assay, 100 per cent. *pure*[1] morphine from the same opium, which yielded a morphine, loaded with impurities varying from ± 20 to ± 10 per cent.[2] by following the somewhat tedious methods of Squibb and of Stillwell.

Assay of Opium.—It should be remembered that in the assaying of opium the same accuracy cannot be obtained as, for instance, in a water analysis, nor is this the case with the determinations of many other alkaloids; thus we find the quantitative determination of atropine generally unsatisfactory; in some processes of assay strychnine splits up to some extent; coniine determinations vary, not unfrequently; assays of quinine are unreliable in the second decimal, etc. It is also known that absolute reliance should not be placed on a single morphine determination, since good chemists, experts in

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[1] It is perhaps not superfluous to here state that it seems to be of very little consequence in pharmaceutical assaying of opium whether or not the morphine contains minute traces of other opium alkaloids (codeine, thebaine, even narcotine) *when the balance is not capable of detecting their presence.*

[2] CORRECTIONS IN OPIUM ASSAYING.—How tenaciously impurities adhere to the morphine in Squibb's process is well known and convincingly shown in Notes I and II below. I copy the extremes observed thus far from my notes.

J. B. N.

I. *Crude Opium.*—Corrections in the crude morphine for impurities to be deducted: 19, 16, 14 and 11 per cent.

II. *Opium Preparations.*—Corrections on morphine to be deducted: 16, 14, 13, 12, 10, 7, 6, 5, 4, 3 and 2 per cent.

opium assaying, may obtain differences amounting to 0·4, 0·5 or 0·6 per cent.

If Flückiger's recent process be somewhat modified and conscientiously followed, I think it is destined to supersede the methods of the U. S. Pharmacopœia, Wainwright, Squibb, Stillwell, Cornwall, Dieterich, and of Pergers. The following embodies directions for thus modifying Flückiger's process for practical analytical work, and is used in the determinations given below:

Dry 10 gm. crude opium in a porcelain dish, at 100° C., for three hours, transfer to a dry mortar and pulverize. Put the powder, guarding against loss, into a filter of 2 inches diameter, pour slowly over the powder a mixture of 10 cc. ether and 10 cc. chloroform, cover well, and after the liquid has drained off, add 10 cc. chloroform. Drain the liquid, spread out the filter and dry its contents; then carefully transfer the washed and dried opium powder to a vial holding about 120 cc., [4 ounces]; add 100 cc. water; cork and frequently shake the vial during two hours. Now filter off 50 cc. into a small salt-mouth bottle, which is not as liable to break as an Erlenmeyer flask. Shake with a mixture of 10 cc. alcohol, of 94 per cent., 20 cc. pure ether, and 1 cc. ammonia water, of 10 per cent., for six hours.* Collect the morphine on a tared filter, wash with as little cold water as possible, or with a saturated solution of morphine, press the filter between blotting paper, afterwards dry at 100° to constant weight, and weigh between watch glasses. The weight multiplied by 20 gives the percentage of pure morphine.

Squibb's manner of removing the ether from the morphine is an improvement on Flückiger's method. If this be done by means of filtering paper, care must be taken that fine crystals are not taken up by capillary attraction; or the ether may be diluted with fresh ether, and removed with a pipette, which is more satisfactory than decanting the ethereal liquid from a salt-mouth bottle. This manipulation has the advantage of preventing the formation of a resinous layer of narcotine along the edge of the filter during the filtration.

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* Dieterich's unfavorable results are unfairly obtained. He exhibits in the *Helfenberger Annalen*, for 1889, a brilliant array of 54 comparative assays, of which not a single one is made according to Flückiger. The interested reader is referred to said *Annalen*, pages 94–96.

The following are fair examples, selected from a large number of comparative assays:

Number of Experiment.	Different lot Crude Opium.	Actual yield of Morphine in grams.	Calculated to per cent. pure Morphine.	Corrections.	With Lime-water, 1 : 100	Method.
	A.					
1	10 grams, ...	1·33	10·4	17·9	Partly insolub.	*Squibb*, 4 days.
2	5 grams, ...	0·53	10·6	None	Clear, colorless solution.	*Flückiger*, 1 day.
	B.					
3	10 grams, ...	1·11 1·08	9·3	16·6 14·2	Partly insolub.	*Squibb.*
4	5 grams powdered, . . 6 " crude, ...	0·577 0·571	9·5	None		*Flückiger.*
	C.					
5	5 grams powdered, . . 6 " crude, ...	0·542 0·540	9	None		*Flückiger.*
	C.					
6	10 grams crude, . . .	1·22	10·7	12		*Stillwell.*
	D.					
7	5 grams powdered, . . 6 " crude, ...	0·592 0·591	9·81	None	Clear, colorless, soluble.	*Flückiger.*
8	10 grams crude, . . .	1·308 1·302	11·6	11·2		*Squibb.*

Squibb's process (a modification of Flückiger's former one). Exhaustion with water rejects the resinous substances, and concentration to a small volume, with subsequent addition of alcohol, rejects starch, gum, sugar, etc. Squibb uses water slightly acidulated with diluted sulphuric acid (1 or 2 drops to 10 gm. opium), exhausting thoroughly. He differs from Flückiger in not using a fractional part of the filtrate, but all of it, and evaporates to a weight equal to that of the opium, and never to more than 1½ times the opium. His further directions are: Transfer to a flask and rinse with the

washings of the residue till the contents of the flask weigh not less than 1·6 nor more than 2·2 of the weight of the opium. Add half its weight of alcohol, shake, add ether (1·5 of the opium weight), shake, add ammonia (0·4 of the opium weight), and shake vigorously till morphine begins to crystallize. After 12 hours pour off the ethereal layer, wash the morphine with ether and dry.

Stillwell follows, in the main, Flückiger–Squibb, washing, however, with morphine saturated alcohol and similar water. He uses hot alcohol to purify the morphine.

The sampling of opium, as now done by different chemists, varies considerably. Since uniformity in this operation would result in preventing much annoyance, I propose the following plan which I have followed for some time and which yields good results: Take, with a knife, a small piece from the inside of every lump in the lot, usually one hundred, mix these pieces together, take 10 gm. for the moisture determination, dry the remainder, pulverize, and then take from this homogeneous mixture 5 gm. for another moisture determination (of the powder), and 10 gm. for the determination of morphine. Calculate the percentage of morphine in the crude opium taking into consideration the amount of moisture contained therein less the moisture contained in the powder. For example: crude opium contains 23·58 per cent., and the powder 3 per cent. of moisture. 5 gm. of the powder yielded 0·577 gm. morphine. Hence 5 gm. powder = 6·025 gm. crude opium, and 6·025 : 0·577 :: 100 : 9·5 per cent. of morphine. (Experiment 4).

Assay of galenical preparations of opium.—The percentage of active principle is calculated by weight. But liquid medicines are, in the United States, usually dispensed by measure, and always are, and will be so administered. Hence, I prefer measuring galenical preparations to weighing them, for analytical purposes.

In the subjoined table I give the *average* percentage of morphine as obtained from the preparation and compared with that found in the opium used. In such assays differences are sometimes found, either an excess or deficiency. Such a difference cannot actually exist, if the opium used for the preparation had been thoroughly exhausted and the dregs were free from morphine; but it must be remembered that no sample taken from opium fully represents the whole. However, I think that my method of sampling means a step nearer to the truth. When working on a large scale, it would be considered a waste of labor, time and money, to subject a large

lot of opium to powdering and then work up this powder into liquid preparations, and it is preferable, considered economically, that a slight discrepancy in the figures be allowed to appear on paper.

It should be mentioned also that in the following assays by the method given above no corrections for impurity in morphine were required; that the morphine thus obtained yielded in all cases with

Number of Experiments 21 in all.	Name of Preparation and Quantity Taken.	Actual Yield Morphine.	Percentage.	Average p. c. of Morphine found in the Opium used.	Assayed according to Squibb.		Number of Experiments 21 in all.
					Correction Required	Result calculat'd to per cent.	
		gm.					
1	Acetum opii, 25 cc.	0·314	1·25	100		Failure.	15
	" "	0·306	1·22	100			16
2	" "	0·314	1·25	100			
3	Fluid extract, 25 cc.	0·382 0·400	1·6	100	Not done	Not done	
4	" 50 cc.	0·700	1·4		5 p. c.	1·42 p.c.	17
5	" "	0·869	1·73	100	2·4 "	1·74 "	18
6	" "	0·699	1·39		3 "	1·29 "	19
7	" 25 cc.	0·562 0·579	2·24 2·31	?	Not done	Not done	
8	Tincture, 50 cc.	0·534	1·06		12 p. c.	1·00 p.c.	20
9	" "	0·638	1·27	100	13 "	1·22 "	21
10	Laudanum, 50 cc.	0·562 0·579	2·24 2·31	?		Discontinued.	
11	Extract, 2 gram	0·43	21·5				
12	" "	0·364 0·358	18·2 18·				
13	" "	0·415 0·409	20·75 20·45	100			
14	" "	0·365 0·357	18·25	?			

100 parts of lime water clear and colorless solutions, only the solution of morphine obtained in No. 8 having some color; also that the preparations assayed were made by the writer, with the exception of Nos. 7, 8, 9, 10 and 14, which had been made by others. Where

two assays are given in the table braced together under one number, they are duplicate assays of the same preparation; No. 2 is the assay, made at a different time, of the vinegar examined under No. 1.

Flückiger's process, for the determination of morphine in crude opium, 1889, applied to acetum opii, solid and fluid extracts, tinctures and wines of opium.—When Professor Flückiger published his method for the determination of morphine in crude opium, it appeared to the writer that it could be applied successfully to the commercial so-called solid and fluid extracts of opium.

To obtain pure morphine as a result of an analysis of fluid extract of opium, was one of the *pia vota* of pharmaceutical assaying. I suppose that the interested reader is familiar with the disappointments of the older processes, the time they absorb, etc. (Compare Lyons' Manual of Pharmaceutical Assaying, 1886, and the admirable Digest of Criticisms on the U. S. P., i and ii, pages 116 and 245.)

Flückiger's process, modified properly for fluid extracts, etc., will be a delight to the analyst and a considerable saving of time. The short time in which crystallization is effected, is decidedly in favor of obtaining pure morphine, while processes with slow crystallization yield the alkaloid impure; if, when following Flückiger's process, crystallization be delayed, the morphine will be impure.

Method.—50 cc. of fluid extract, tincture or wine of opium are evaporated in a waterbath to two-thirds of the volume, or a little less. Acetum opii is evaporated to dryness, and the residue treated as a solid extract. The residue is transferred to a separator, using as little water to wash as possible. Agitate with 10 cc. of a mixture of equal volumes of ether and chloroform. This is separated and rejected, and the operation is repeated with a fresh portion of ether and chloroform (the ether must be free from alcohol). The fluid is now filtered through a moist filter of two inches diameter. The filter is washed with the rinsings of the separator; no unnecessary quantity of water to be used. Care is needed that the filter does not dry out. The total fluid, of about the same volume as the original fluid, is collected in a wide-mouthed bottle of 100 cc. capacity with round shoulders (an Erlenmeyer flask being too fragile). Then add 10 cc. alcohol of 94 per cent., 20 cc. ether and 1 (one) cc. ammonia of 0·96 s. gr.; cork; agitate very frequently during six hours; set aside in a cool place over night; absorb the ether as stated above; collect the fine crystals with the filtrate on a tared filter in the proper way; wash them with

the least quantity of cold water; press the filter with the morphine, between blotting paper; dry at 100° C. to constant weight; weigh between watch crystals and calculate the result to percentage. The assay will consume only one day's time.

Solid extracts will have to be dissolved in water and treated as above. I take two grams, dissolve in 50 cc., water and obtain the most satisfactory results with 1 (one) cc. ammonia.

I am of the opinion that a dilute fluid and the least possible quantity of ammonia is to be preferred to a concentrated fluid and an excess of ammonia as used in other processes of morphine assaying. This process compares favorably with the Helfenberger method, *and withi ts many weighings* (*Helfenberger Annalen*). No second assay is required of the morphine itself. The simplicity of operation and the satisfactory quantitative results are especially to be commended. The acidity of the wine, used in vinum opii, has to regulate the amount of ammonia, which must be slightly in excess; usually 2 cc. answered the purpose.

LABORATORY OF PARKE, DAVIS & CO., DETROIT, July, 1890.

ARTIFICIAL AND NATURAL DIGESTIONS.[1]

BY A. S. LEA.

The following factors, present in normal digestion, are absent in artificial digestion experiments as usually performed in flasks and beakers: (1) Constant movement of the contents; (2) constant removal of digestive products; (3) continuous additions of fresh portions of digestive fluid. In the present experiments, an apparatus was employed which tends to obviate these disadvantages. The artificial digestion is carried out not in a flask, but in a tube of parchment paper, kept in constant up and down movement by connecting it to a motor; this tube is suspended in a cylindrical glass vessel, filled with the same mixture as that contained in the tube, but minus any ferment; an outer cylindrical glass vessel is filled with water kept at the necessary constant temperature. By this means, two of the more important conditions under which natural digestion takes place may be imitated, namely, continuous movement, and removal by dialysis of digestive products.

The first question investigated was the digestion of starch by

[1] *J. Physiol.*, **11**, 226–263. Reprinted from *Jour. Chem. Soc.*, 1890, p. 536.

saliva; the great contrast between natural and artificial digestion of starch is the appearance of large quantities of dextrin in the latter case (opinions, however, differ as to the relative amounts of sugar and dextrin formed), whilst in the stomach and intestines mere traces of the dextrins are discoverable. Nothwithstanding imperfections in the present method of experimentation, which are freely admitted, the contrast between a digestion carried on in the moving dialyser and in a flask is very marked; the iodine reaction of starch or dextrin disappears first in the contents of the dialyser; in prolonged digestions the contents of the dialyser remain clear and more free from putrefactive organisms than those of the flask, and the proportion of dextrin present is less in the dialyser than in the flask. This last point may be illustrated by the following table:

	Duration of experiment in hours.	Strength of starch in solution per cent.	Dextrin per cent. in dialyser.	Maltose per cent. in dialyser.	Maltose per cent. in dialysate.	Dextrin per cent. in flask.	Maltose per cent. in flask.
1	6	0·4	7·67	—	—	15·23	—
2	22	2·4	8·58	—	—	14·16	84·23
3	21	4·23	16·78	—	—	36·62	61·81
4	68	4·23	8·48	—	—	35·70	62·33
5	18	0.43	10·31	12·42	76·67	—	—
6	48	4·18	12·61	14·20	71·15	—	—
7	90	3·35	4·29	3·06	91·18	—	—

The conclusions drawn from these and similar experiments are as follows:

When the digestion of starch by saliva is carried out under conditions which ensure a very considerable removal of the products (maltose) as they are formed, then:

(1) The *rate* at which the digestion takes place is increased.

(2) The total *amount* of starch converted into sugar is much greater, and the residue of dextrin is much less, than under conditions, otherwise similar, when the products are not removed.

(3) The influence of the removal of digestion products on the relative amounts of dextrin and maltose formed is least marked when the starch solution is dilute.

(4) These results justify the assumption that in the alimentary canal starch is completely converted into sugar before absorption.

(5) The experiments afford no evidence that any sugar other than maltose is formed by the action of saliva on starch.

The next series of experiments dealt with the pancreatic digestion of proteïds; here the occurrence of an insoluble bye-product (anti-albumid) is believed to be due to the imperfection of the method of artificial digestion, and probably does not occur in natural digestion; the question, however, which was specially investigated was the occurrence of leucine and tyrosine. Kühne has already stated that these amido-acids are formed in natural as well as in artificial pancreatic digestion, but careful quantitative experiments do not seem to have been made, although it may be roughly stated that less of these materials are found in the intestines than in a flask. This may be due to one of two causes; either they are normally formed in large amount and then rapidly absorbed, or else they are formed in only small amount. By the help of the digesting dialyser, combined with the examination of the intestinal contents of animals, it was hoped in the present research to elucidate this question. A few typical experiments are described in detail and the following conclusions drawn: (1) The undigested residue in a flask digestion is always greater than that of a dialyser digestion, other conditions being the same; (2) the amount of leucine and tyrosine formed in a flask digestion is always greater than in a dialyser digestion, other conditions being the same. The amount formed in a dialyser digestion is, however, always considerable, and it is possible that the amount formed is less than in a flask digestion, because the peptones from which they originate are continually dialysing out. Leucine and tyrosine were also found in not inconsiderable quantities in the intestines of the animals examined, not merely in microscopic amounts, as some previous observers seem to imply.

The paper concludes with remarks of a theoretical nature on the function of the amido-acids formed in plants and in animals. It is regarded as inconceivable that the animal, like the vegetable organism, should construct its proteïds from the nitrogen contained in the amido-acids, and their importance is likened to that of the inorganic salts and extractives contained in beef-tea, or other meat extract. We do not know what part these play exactly in the total processes of tissue-metabolism, but we do know that the salts are in some way essential, and that the extractives are an extremely important accessory to that metabolism.

Experiments on the pancreatic digestion of starch are in progress.

The term *zymolysis* is suggested as a convenient one to denote generally the changes produced by enzymes or unorganized ferments.

RESEARCHES ON THE GERMINATION OF SOME OF THE GRAMINEÆ.[1]

By Horace T. Brown and G. Harris Morris.

The investigation was undertaken with a view of throwing some light upon the complex metabolic processes which take place during the germination of seeds. The authors during the progress of the inquiry have examined the seeds of a great number of grasses, but this, the first part of their paper, is confined almost entirely to a consideration of the changes which take place in barley, during the early periods of its growth.

In recording the visible changes which occur in the seed during germination, it is shown that a disintegration and dissolution of the cell-walls of the endosperm always precede any attack upon the cell contents. This breaking down of the cell-wall is shown in a subsequent portion of the paper to depend on the production during germination of a special cellulose-dissolving or "cyto-hydrolytic enzyme," which, like diastase, is soluble. The action of this enzyme on the cell-walls of some kind of vegetable parenchyma is very energetic. The physiological importance of this cyto-hydrolyst is very great, for, owing to the non-diffusible nature of the amylo-hydrolytic enzyme, diastase, the previous breaking down of the cell-wall is a necessary prelude to the dissolution of the contained starch-granules.

The authors show that the appearance of the cyto- and amylo-hydrolysts is due to a specialized secretory function of the layer of columnar epithelium which covers the outer surface of the scutellum. It has hitherto been considered that the functions of this epithelium was exclusively that of an absorptive tissue; its absorptive as compared with its secretory functions are, however, of quite secondary importance.

The natural food material, *starch*, does not appear to have any special power of stimulating the cells of the epithelium to increased secretion of a diastase, but the flow of diastase and of the cyto-hydrolytic enzyme from these cells is affected in a very remarkable manner by the presence of certain carbohydrates. Providing the

[1] Read before the Chemical Society, London, April 3; abstract prepared from *Chemical News*, April 25, 1890, by G. M. Beringer. The paper printed in full in *Journal of the Chemical Society*, June, occupies seventy pages.

carbohydrate is one which is readily assimilable by the embryo, such as cane-sugar or maltose, secretion of ferment is checked or even entirely inhibited. No such inhibitory action is, however, produced by such substances as mannitol and milk-sugar, which are entirely without nutritive value. The authors' experiments in this direction point to the secretion of the amylo-hydrolytic and cyto-hydrolytic enzymes as being to some extent *starvation phenomena.* The power of secretion possessed by the epithelium is in some way or other so adapted to the requirements of the young plants as to be only exercised when the supply of tissue-forming carbon compounds begins to fail.

The authors confirm the important generalization of Sachs that the relation of the embryo to the endosperm is that of parasite to host, and they have availed themselves of this relation by cultivating the embryo upon suitable media after separating it from its endosperm, and in this way they have obtained information with regard to the secretory powers of the embryo and the chemical modifications of its absorbed nutriment, which it would have been impossible to obtain by any other means.

The results of cultivating the excised embryos upon various nutrient solutions, more especially of the carbohydrates, are recorded, and it is shown that whilst cane-sugar, invert-sugar, dextrose, lævulose, maltose, raffinose, galactose and glycerol have all more or less nutrient value, milk-sugar and mannitol do not in any way contribute to the growth of tissue in the young plant. Of all the substances tried, cane-sugar has by far the greatest nutritive power. Maltose, although the natural food of the embryo when attached to its endosperm, is decidedly inferior in this respect to cane-sugar. This is shown to be due to the fact that maltose directly it is absorbed by the growing embryo becomes transformed into cane-sugar by the living cells, and in this form is passed from cell to cell. When cane-sugar is supplied ready formed to the young plantlet there is manifestly a saving of energy to the living cell which receives its nutriment in a form in which it is directly available for its requirements.

An examination of the sugars produced during the germination and of their mode of distribution in the grain have convinced the authors that the transformed starch of the endosperm is absorbed by the embryo in the form of maltose; and that the seat of production

of the cane-sugar which germinated grain contains is the tissues of the embryo itself.

In the discussion following the reading of this interesting paper, Mr. Thiselton Dyer said that botanists had already made some progress in localizing enzymes; thus Professor Marshall Ward had shown that the enzyme which effects the liberation of the coloring matter from the glucoside in Persian berries is located in the raphe; and it had long been known that emulsin was not distributed throughout the bitter almond. After referring to the distinction between animals and plants, he said that the plant was similar to the seed, the bud corresponding to the embryo, and the woody shoot to the endosperm. Baranezky had shown that a diastase is omnipresent in plants, and there could be little doubt that it would be found that an enzyme capable of attacking cellulose was equally so.

Professor Marshall Ward pointed out that in the seeds of the Gramineæ, Cyperaceæ and other families of plants there is a peculiar layer of cells, from one to three or more deep, surrounding the starchy endosperm and distinguished from the latter by containing no starch but relatively large quantities of proteids; this layer belongs to the endosperm, but as the seed ripens the cells store special proteids instead of the starch grains which predominate in the other endosperm cells.

In the oat there is such a layer, one cell deep, and it has been shown that, during germination, the dissolution of the starch and the cell-walls of the starch containing cells begins near the surface of this layer, which itself persists and the cells of which take up food and undergo changes so like those of excreting cells, that it was concluded that they excrete the diastatic enzyme. Haberlandt declares that when starch-grains are placed in contact with a piece of this layer kept moist and at proper temperatures, the grains even of the resistent potato starch are corroded as on germination; whereas control experiments, where all conditions are the same except the presence of the cells of the proteid layer, showed no such corrosion.

The proof that a cellulose dissolving enzyme exists in barley is borne out by various recent researches and by Wortmann's researches on the behavior of bacteria in a mixture of starch and proteids. Wortmann proved that so long as the bacteria were fed

with proteids they refused to excrete the diastatic enzyme which they produce in abundance when only carbohydrates are at their disposal. Similar proteid layers exist in the seeds of buckwheat and in the tubers of some potatoes.

Professor Green said that in the case of the date stone his observations led him to believe that the enzyme was independent of the endosperm, and that probably it was located in the epithelial layer, but in castor-oil seeds not only the embryo but also the endosperm cells appeared to be possessed of vitality, the fatty matter in the latter undergoing change even when not subject to the action of the embryo; probably the enzyme was present in the form of an enzymogen, as extracts of the seeds were rendered active by acids.

CLOVE CULTURE IN ZANZIBAR.[1]

Zanzibar is noted for being the principal source of the world's supply of cloves, and a report on the cultivation of this article of domestic economy may prove of interest.

When speaking of Zanzibar, we include the islands of Zanzibar and Pemba, three-fourths of the entire crop of cloves being produced in Pemba. Those grown on the island of Zanzibar are reckoned of superior quality and command the better price, but this is probably due to the fact that the owners reside here, and can thus give their affairs the benefit of direct supervision.

Certainly the conditions for their successful cultivation are most favorable at Pemba, where the rainfall exceeds that of Zanzibar, but the management being left to careless overseers, the result is the cloves are imperfectly cured and (but little care being observed in handling) are frequently marketed in an inferior condition.

The clove tree was first introduced into this country by the then Sultan, Seyed Said bin Sultan, about the year 1830, since which time its cultivation has gradually extended, until it is now the chief industry of the islands.

The industry received a check in 1872, the date of the great hurricane. At least nine-tenths of the trees were destroyed at that time, so the larger part of those now standing are of new growth.

A peculiarity of the clove tree is that every part is aromatic, but

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[1] Report of Consul Pratt. Reprinted from the *Oil, Paint and Drug Reporter.*

the greatest strength is found in the bud, which is the "clove" of commerce. The finest quality of cloves are dark brown in color, with full, perfect heads, free from moisture.

In the cultivation of the clove, the first thing to be done is the starting of the shoot. The seeds are planted in long trenches and are kept well watered until after sprouting. In the course of forty days the shoots appear above ground. They are carefully watered and looked after for the space of two years, when they should be about 3 feet in height. They are then transplanted, being set about 30 feet apart, and are kept watered till they become well rooted. From this time on the young trees require only ordinary care, though the best results are obtained when the ground about the trees is well worked over and kept free from weeds.

The growth of the tree is very slow, and five or six years are required for it to come into bearing, at which time it is about the size of an ordinary pear tree and is usually very shapely. It is a pretty sight to see a young plantation just coming into bearing. The leaves, of various shades of green tinged with red, serve to set off the clusters of dull red clove buds.

As soon as the buds are fully formed and assume this reddish color the harvesting commences, and is prosecuted for fully six months at intervals, since the buds do not form simultaneously, but at odd times throughout the whole period. The limbs of the tree being very brittle, a peculiar four-sided ladder is brought into requisition, and the harvesting proceeds apace.

As fast as collected, the buds are spread out in the sun, until they assume a brownish color, when they are put in the storehouse and are ready for market.

A ten-year-old plantation should produce an average of 20 pounds of cloves to a tree. Trees of twenty years frequently produce upwards of 100 pounds each.

The present season, commencing with July, 1889, is very favorable, and the crop will exceed that of any previous season. It will, in all probability, amount to 13,000,000 pounds, averaging a local value of 10 cents per pound.

The Sultan derives no inconsiderable portion of his revenue from this source, since the duty is levied at 30 per cent. *ad valorem*, thus placing to the Sultan's credit for the present year nearly, if not quite, $400,000.

Besides the clove buds, the stems are also gathered, and form an article of commerce, commanding about one-fifth of the price of cloves and having about the same percentage of strength. To this circumstance is due the fact that ground clove can frequently be purchased in the market at a lower price than whole cloves.

For the past fifteen years the cultivation of cloves has been the chief occupation of the Arab planters and has always netted good returns. It seems probable that it will continue to be a profitable crop, since the consumption of the article appears to keep pace with the inevitable increase of production.

Up to the present time the plantations have been worked with slave labor at comparatively small expense; but with stoppage of slave supplies from the mainland, great difficulty will be experienced by the planters during harvest time. One result will be an increase in expenses; but what the planters have most to fear is that the curtailment of the labor supply will entail a direct loss by rendering it impossible to harvest the crop until after it has blossomed, when it would be unfit for the uses of commerce.

ISOCINNAMIC ACID IN THE COCAINE ALKALOIDS.[1]

By C. Liebermann.

The decomposition-products of the alkaloids accompanying cocaine contain isocinnamic acid, which can be isolated in the following manner: The crude product obtained by decomposing the alkaloids (38 kilos.) with hydrochloric acid is filtered from the solid acids, and the filtrate extracted with ether; on evaporating the ether there remains a semi-solid mass (700–800 grams). This residue is filtered to separate the solid acids, which consist principally of cinnamic acid, together with small quantities of α- and β-truxillic acids and benzoic acid, the oily filtrate is kept for some days at 0°, and again filtered from the crystals which are deposited. The filtrate (300–400 grams) is dissolved in cold sodium carbonate, the solution shaken with ether to remove ethereal salts which may be present, and the acids reprecipitated. The acid mixture is then extracted with warm light petroleum, and the solution evaporated. The crude isocinnamic acid (about 120 grams), obtained in this way in a crystalline condition, is further purified and separated from

[1] *Ber.*, **23**, 141–156. Reprinted from *Jour. Chem. Soc.*, May, p. 494.

cinnamic acid by repeatedly extracting it with small quantities of light petroleum, in which cinnamic acid is only very sparingly (0·095 in 100), isocinnamic acid, on the other hand, readily (17 in 100) soluble. It is then converted into the calcium salt, and the latter extracted with water, in which calcium cinnamate is only very sparingly (1 in 430), but calcium isocinnamate readily (1 in 8) soluble. These two processes are repeated many times until the calcium salt obtained is completely soluble in a small quantity of cold water. The salt is then decomposed with hydrochloric acid, and the acid, which is precipitated as an oil, extracted with ether, and recrystallized from light petroleum.

Isocinnamic acid, $C_9H_8O_2$, separates from cold light petroleum in transparent crystals melting at 45–47°; if the acid be coarsely powdered and treated with a small quantity of cold light petroleum in such a way that the more compact crystals remain undissolved, the latter melt at 57°, which is the true melting point of the acid. It is very readily soluble in light petroleum, carbon bisulphide, alcohol and all ordinary solvents, except water, whereas cinnamic acid and atropic acid are only sparingly soluble in light petroleum and carbon bisulphide. Molecular weight determinations by Raoult's method, in glacial acetic acid solution, gave results in accordance with the molecular formula given above; on evaporating the acetic acid solution on the water-bath, the isocinnamic acid was deposited unchanged. It is immediately oxidized by potassium permanganate in cold sodium carbonate solution, with formation of benzaldehyde, but it does not reduce Fehling's solution, and it is not changed by boiling alcoholic potash. Crystalline measurements showed that this acid is not identical either with cinnamic acid or with atropic acid.

The *calcium* salt $(C_9H_7O_2)_2Ca + 3H_2O$, separates from cold water in crystals which effloresce on exposure to the air; the salt then contains 3 mols. H_2O, which are expelled at 125°. The *barium* salt is not quite so readily soluble in water as the calcium salt. The *silver* salt, $C_9H_7O_2Ag$, is colorless, and undergoes no change on exposure to light. In aqueous solutions of the ammonium salt, cobalt, manganese and zinc acetate produce no precipitation, but copper acetate gives a green, and mercuric nitrate a colorless precipitate. The *methyl* salt is a colorless liquid.

Isocinnamic acid begins to boil at 265°, but the boiling point

gradually rises to 300°. The distillate consists principally of cinnamic acid (90 per cent.), but on prolonged boiling cinnamene is also produced. Isocinnamic acid is almost quantitatively converted into cinnamic acid when it is boiled for about a minute under the ordinary pressure.

Hydrocinnamic acid (m. p. 48°) is obtained when isocinnamic acid is dissolved in soda, and the solution treated in the cold with sodium amalgam of 3 per cent.; the yield is almost quantitative. When isocinnamic acid is treated with bromine in cold carbon bisulphide solution, it is converted into phenyl-$\alpha\beta$-dibromopropionic acid (m. p. 196°); the yield is on the average 45–50 per cent. of the acid employed. Methyl isocinnamate, under the same conditions, is converted into methyl phenyl-$\alpha\beta$-dibromopropionate (m. p. 117°). Isocinnamic acid is not changed when treated with iodine in cold carbon bisulphide solution, but on warming it is converted into cinnamic acid.

Isocinnamic acid dissolves almost completely in hydrobromic acid, and in about 24 hours it is completely converted into phenyl-β-bromopropionic acid (m. p. 137°); it is completely converted into phenyl-β-chloropropionic acid (m. p. 126°) when it is dissolved in a saturated solution of hydrogen chloride in glacial acetic acid and the solution kept for three to four days, whereas cinnamic acid under the same conditions is only very partially converted into the same additive compound.

Isocinnamic acid and cinnamic acid both require the same quantity (4 mols.) of potassium permanganate for complete oxidation to benzoic acid.

Isocinnamic acid occurs in storax; from about 2 kilos. of crude cinnamic acid from this source, the author isolated about 2 grams of pure isocinnamic acid by the method described above.

The relationship existing between cinnamic acid and isocinnamic acid can be explained by accepting Wislicenus' hypothesis; in accordance with this view, the acids would have the constitution

$$\begin{array}{l} \mathrm{Ph{\cdot}C{\cdot}H} \\ \quad\| \\ \mathrm{COOH{\cdot}C{\cdot}H} \end{array} \quad \text{and} \quad \begin{array}{l} \mathrm{Ph{\cdot}C{\cdot}H} \\ \quad\| \\ \mathrm{H{\cdot}C{\cdot}COOH} \end{array} \quad \text{respectively.}$$

The behavior of isocinnamic acid is in complete accordance with the view that it is a labile form of cinnamic acid.

ABSTRACTS FROM THE FRENCH JOURNALS.

Translated for the AMERICAN JOURNAL OF PHARMACY.

AMORPHOUS AND CRYSTALLIZED DIGITALINS.—The *Société de Pharmacie de Paris* has appointed a commission to examine into the composition and decide as to the relative strength of the digitalins, a matter which has long remained in a confused condition. At the *séance* of May 7, M. P. Vigier said: "Recent researches which appear to establish that amorphous, chloroformic digitalin, and the crystallized digitalin of the Codex, have the same physiological activity, can only create uncertainty among pharmacists, for they know that the Codex allows one mgm. as the dose for amorphous, and one-quarter mgm. as the dose of crystallized digitalin. The recent researches were made with an amorphous, chloroformic digitalin of a manufacture not indicated; and it is certain that all makers do not produce an amorphous digitalin which is as active as the crystallized drug." M. Vigier approved of the appointing of the commission referred to, and thought that crystallized digitalin should alone be admitted into the Codex.

IS EXALGINE A DANGEROUS REMEDY?—In a long article in the *Rev. méd. de la Suisse rom.*, Prof. Prevost made the following remark: "Methylacetanilid is a more dangerous substance than antipyrine. It is also more dangerous than acetanilid, its solubility considered, and it is well to be circumspect in its use, especially until a riper experience has more definitely decided as to the kind of accidents to which it may give rise." To this, Dr. Bardet replies (Nouv. Rem., June 24), that in the single case of poisoning cited by Dr. Prevost the symptoms were caused by the prolonged use of exalgine in doses of 40 cgm., 3 times a day, and the obstinate constipation of the patient. Dr. Bardet wrote to Dr. Lloyd Jones (who attended the case) and learned that the doctor attributed the result to "an abnormal constipation." He said, furthermore: "I have frequently recommended exalgine and have a very favorable opinion as to its analgesic qualities." M. Bardet added that exalgine had now been in use for eighteen months and the accident cited was the only one to be found in medical literature. Like all active medicaments it should, of course, be used prudently; but if we are to renounce it as dangerous, we must also give up the use of all medicaments capable of producing toxic effects.

Solutions of Borate of Sodium and Cocaine.—At a meeting of the *Société de Pharmacie*, M. Julliard advised the addition of a small quantity of glycerin to these solutions to prevent the precipitate caused by the alkalinity of the sodic salt. M. Patein thought the salt was not alkaline, but that alkalinity was developed by solution, M. Grimbert said that the glycerin did not re-dissolve the cocaine, but caused a well-known acid reaction in the borate of sodium. The members finally agreed with M. Thibaut that it was not worth while to resort to the use of glycerin in these solutions, as the precipitated cocaine would easily re-dissolve on the addition of a small quantity of boric acid.

Estimation of Ash in Glycerin.—M. Vizern proposes the following method as giving more exact results than the processes usually employed. Weigh 10 gm. of glycerin in a porcelain capsule and burn it so as to obtain a charred mass, which should be moistened with distilled water. Place upon a filter and wash several times with small quantities of water, saving all the liquids. Then calcine the filtrate in a platinum capsule. The charred mass, being now deprived of nearly all of its salts, burns well. After cooling, pour in the filtered liquors and evaporate in a bath, being particular to avoid ebullition. After desiccation the temperature should be raised so as to drive off all the water.—*Répert. de Phar.*, June.

A New Colorant from Grapes.—According to M. Carles (*Jour. de Phar. et de Chim.*, June 1), such a substance has lately been offered in the market. The coloring matter of grapes consists, he says, of a blue, a yellow and a red, which are soluble in wines, and in sugar and water to which a small quantity of alcohol has been added. The blue portion of the combined pigment becomes slowly insoluble and passes into the lees. In this state it is still soluble in strong alcoholic solutions and reddens under treatment with acids. With tartaric acid it gives a very beautiful color, and it is to this colorant that M. Carles refers as having become a commercial article. It appears to be used in coloring white wines and raisin wines. But in a few months the colorant decomposes and the liquid becomes turbid. The addition of gum simply restores to the preparation its white color.

Sterilization of Catgut by Heat.—M. Larochette, a Lyons pharmacist, says (*Lyon Médical*) that the operation of heating catgut with oil does little more than fry that substance. His method is

to heat it in a Wiesnegg stove. If the latter apparatus is not at hand, it is sufficient to use a large, wide-mouthed jar, into which the gut and cotton wadding are introduced, the jar being then closed tightly with a cork. Three openings should be made in this "bottle stove," one for the introduction of a thermometer, one for a tube to conduct the vapor from the interior, and a third to hold Roux's temperature regulator. Moderate heat must be used at first, the temperature being gradually carried to 140° C., when the catgut becomes asceptic. The gut is removed with forceps previously sterilized, and should be immediately placed in olive oil, which has been previously boiled, and to which has been added 10 to 100 of its weight of phenic acid. It is not thought necessary to begin by removing the fat from the catgut, as it is not the presence of fat, but of humidity which alters the cord during the operation of heating.—*Répert. de Phar.*, July 10.

PHARMACEUTICAL COLLEGES AND ASSOCIATIONS.

The Indiana Pharmaceutical Association assembled at Lake Maxinkuckee, July 8, at its ninth annual meeting; Vice-President Bryant in the Chair. Reports of committees and of the executive officers were received and discussed, the most important one being on legislation and the draft of a pharmacy law, which will be presented to the next Legislature, and it was stated with better prospects for its passage than in former years. A paper by E. G. Eberhardt on *spirit of nitrous ether* recommends a process for its preparation in which sawdust is used. For the preparation of *pure merçurous iodide*, J. K. Lilly recommended precipitation from dilute solutions of mercurous nitrate and potassium iodide. Professor Hurty was elected President for the current year, and the Association finally adjourned to meet again in Indianapolis on the second Tuesday of May, 1891.

The Kentucky Pharmaceutical Association held its thirteenth annual meeting in Richmond, May 21, and listened to the address by the President, the reports of committees, and to the reading of several papers. President for the current year is J. J. Brooks, Richmond. The next meeting will be held at Frankfort.

The Massachusetts State Pharmaceutical Association convened at its ninth annual meeting in Brittain Hall in Haverhill, June 18 to 20; President Snow in the Chair. Mayor Burnham welcomed the visitors to the city. The President's address, reports by the Secretary, the Treasurer and the several committees, also a number of valuable papers prepared by members occupied the attention of the meeting. Percolation and maceration, and the advantages of each in special cases formed the subject of one of the papers read by Professor Patch, while in another one simple tests were given for detecting adulterations in a number of pharmacopœial drugs. Advance in pharmacy was the subject

of a paper by Professor Pengra; the size of drops of different liquids, by J. W. Colcord; the preparation of medicated waters, by D. G. Benedict; on co-operation among pharmacists, by S. A. D. Sheppard; comparison of upward and downward percolation, by Prof. Patch; iron solutions, by B. Scoville; Preston salts, by W. W. Bartlet; use of the microscope, by Prof. Pengra; formulas for perfumes, by L. H. Leavitt. E. C. Marshall, Charlestown, was elected President for the current year; J. W. Colcord, Boston, Secretary, and F. B. Nichols, Salem, Treasurer. The next meeting will be held in Boston in June, 1891.

The New Jersey Pharmaceutical Association met at its twentieth annual meeting in Jersey City, May 28. Mayor O. Cleveland welcomed the association to the city. The address by President Thorn related mainly to business affairs, to the qualification of apprentices, and to legislation. Reports were presented by the officers, committees, and the delegations to the Pharmacopœial Convention and to the pharmaceutical associations of neighboring states. A number of papers were read by P. E. Hommell on the coloring matter for compound spirit of lavender and compound tincture of cardamom; on the uselessness of pharmacopœial wines; on soap liniment; and on the use of waxed paper for Seidlitz powders; on pure extract of liquorice, by C. R. Paddock; and a paper on soda water, by F. B. Kilmer. The officers for the current year are: President, Maxwell Abernethy, Jersey City; Secretary, C. F. Dare, Bridgeton, and Treasurer, W. M. Townley, Newark. The next meeting will be held at Trenton on the fourth Wednesday of May, 1891.

The New York State Pharmaceutical Association held its twelfth annual meeting at Auburn; President Gregory in the Chair. The first session was opened with an address of welcome by Mr. Woodruff, President of the Board of Trade, after which the President delivered his annual address. The reports of the Secretary and Treasurer showed a membership of 762, and a cash balance on hand amounting to $1,101. Among the reports of committees those on adulterations, on new remedies, and on county organizations attracted general interest, and the report on the President's address elicited much discussion, resulting in the adoption of measures calculated to increase the usefulness of the association. Among the papers were the following: on oleate of mercury, and on phosphoric acid, by Dr. Huested; on fruit syrups, by C. H. Gauss; and on the use of compressed carbonic acid for making soda water, by Dr. Gregory. Professor W. G. Gregory was re-elected President; C. W. Holmes, Elmira, Secretary, and C. H. Butler, Oswego, Treasurer. Bluff Point on Lake Champlain was selected for holding the next annual meeting on June 25, 1891. The Local Secretary is John H. Smith, of Plattsburgh.

The Ohio Pharmaceutical Association was convened at its twelfth annual meeting in Memorial Hall, Toledo, June 10, President Sherwood in the Chair, and was welcomed with an address by Mayor Hamilton. The President's address and the reports of the other officers and of committees occupied the association during the first two sessions. Among the papers read were the following:

On Salicylic Acid, by J. G. Spenzer and J. D. Lisle. Both essays give the results of the examination of commercial specimens, Mr. Lisle having examined four samples, while Mr. Spenzer's investigation embraced fourteen

samples of the synthetical and two of the natural acid, the result being that the commercial acid is of good quality, contains mere traces of phenol, and is free from coarser adulterations. The largest amount of phenol was determined by Mr. Lisle, by calorimetric estimation, at 0·328 per cent. ; the odor of phenol could not be detected in any of the samples.

Cocaine hydrochloride, by J. G. Spenzer. Thirty-seven commercial samples of the salt were examined, according to condition, color, odor, taste and by eighteen additional tests, the author summarizing his results by the statement that the crystalline cocaine hydrochloride is of the better quality, and fully supports the good authority who have repeatedly advocated the use of only the crystalline form ; also, some American cocaine hydrochloride is equal to any foreign make in purity.

Syrup of iron, quinine and strychnine.—W. Simonson proposes the following formula, which yields a syrup containing in the pint 132 grains of alkaloids and 128 grains of ferrous phosphate. Take of

	Grs.
Iron, fine wire, in small pieces,	62
Phosphoric acid (50 per cent.)	800
Quinine, dried at 100° C.,	128
Strychnine,	4
Sugar,	12 oz. (av.)

Distilled water a sufficient quantity.

Dissolve the iron in 650 grs. of the phosphoric acid diluted with one fluidounce of water, heating the mixture gradually from 50° C. to its boiling point. Dissolve the quinine and strychnine in 150 grs. of the phosphoric acid diluted with four fluidounces of water, heating to 60°–80° C. ; filter through a small filter and pass sufficient water through the filter to make six fluidounces. Heat this solution to 80° C., and in it dissolve the sugar quickly by rapid and constant stirring. Strain the solution through a small strainer and pass sufficient water through the strainer to make thirteen fluidounces. Filter into this, using a small plaited filter, the iron solution as soon as it is finished, and pass sufficient water through the filter to make sixteen fluidounces. Having mixed the filtrates thoroughly, store the syrup in bottles, which should be filled completely.

The election of officers resulted in the choice of F. N. Heath, Toledo, for President ; L. C. Hopp, Cleveland, Secretary, and F. A. Kantz, Cincinnati, Treasurer. Dayton was selected for holding the next annual meeting, June 9, 1891. J. G. Spengler was elected Local Secretary.

The Oregon Pharmaceutical Association was organized in the city of Portland, June 10 and 11, when a constitution and by-laws were adopted, and the draft of a pharmacy law was considered and a committee appointed to present the same to the legislature. A paper was read by Dr. Cottel, reviewing a number of prescriptions as to the preparations ordered by physicians. M. M. Davis, Jaquima City, was elected President ; H. D. Dietrich, Portland, Secretary, and L. G. Clarke, Portland, Treasurer. The first annual meeting will be held in Portland on the second Tuesday of June, 1891.

The Washington State Pharmaceutical Association held its first meeting since the organization (see April number, p. 200) at Tacoma, May 12. The prin-

cipal business attended to was the consideration of the pharmacy law, which had been presented to the Senate, was amended and passed by that body, but failed in the House for want of time before final adjournment. Several amendments were proposed, and the bill was again entrusted to a special committee for presentation to the next legislature. A. C. Clark, Olympia, was re-elected President, and W. St. John, Tacoma, was elected Secretary and Treasurer. The Local Secretary for the next meeting is D. O. Woodworth, of Ellensburgh, at which place the association will convene May 11, 1891.

The following printed Proceedings of State Pharmaceutical Associations have been received:

Alabama.—Ninth annual meeting. pp. 73. See July number, p. 374.—The pamphlet contains the following papers read at the meeting: Antipyrine, by A. E. Brown; Extemporaneous Pharmacy, by P. C. Candidus; Past and Future, by W. F. Punch; Sulfonal, by J. W. Milner; Elective Affinity, by T. P. Boyd; Cutting on Patents, by J. D. Humphrey; and a very valuable monograph by Chas. Mohr on the Medicinal Plants of Alabama, of which a reprint has also been received. The antidote to the *cutting on the prices* of specialties recommended in Dr. Humphrey's paper is, perhaps, best explained in his own words, by quoting the following sentences: "I buy the very best drugs obtainable, put up my preparations in the same general style as similar patents are put up, but I do not steal the name or adopt the special style of package of any one. * * * While, of course, I lose the profits on what patents I sell, I make a fair margin on my own goods, and having a fair trade on these, I have about lost all interest in the silly war. * * * The success I have met with in my own goods causes me to wonder why it is that more of you do not put up your own preparations. Do not go to the 'non-secret' medicine man for your goods. * * * Really, if there is any difference it is in favor of the patents."

Connecticut.—Fourteenth annual meeting. pp. 108. See April number p. 200.—The next meeting will be held in New Haven, February 3 and 4, 1891.

Florida.—Fourth annual meeting. pp. 87. See June number, p. 311.—Among the papers read were the following: The medicinal properties of Florida plants, two papers by Dr. Meriwether and L. W. Cherry; Cornus florida, by H. C. Cushman; The Saw Palmetto, by J. M. Dixon.

Kansas.—Eleventh annual meeting. pp. 82. See July number, p. 374.—In addition to the papers mentioned before, the following were read at this meeting: Improvement in Tinctures, by H. W. Spangler; on Hydrocyanic acid, by Professor Sayre; and on the Metric system, by E. W. Barnes.

School of Pharmacy of the University of Michigan.—The annual commencement was held on June 26, and 32 candidates received the degree of Pharmaceutical Chemist. Commencement exercises were held, with those of other departments of the same institution, in University Hall, and ex-President A. D. White, of Cornell University, gave the oration. The annual meeting of the Pharmaceutical Alumni Society was held on June 25, and, after a dinner, an address was given by Dr. Chittick, of Detroit.

The Chicago College of Pharmacy closed its spring course during the past month. The commencement exercises were held at Hooley's Theatre, on the afternoon of July 28.

EDITORIALS.

American Pharmaceutical Association.—A circular issued by Professor Whelpley, Chairman of the section on scientific papers, gives the titles of the essays which have been promised for the approaching meeting of the American Pharmaceutical Association. It is well that the subjects to be brought forward become known beforehand, as thereby members will be the better enabled to participate in the discussions of matters, on which reports will be made. As far as furnished, the following essays will be laid before the meeting :

The Douglas spruce as a substitute for cork.

The Pacific Coast species of rhamnus.

American isinglass.

The medicinal plants of Florida.

The Florida phosphate deposits.

The active principle of arnica.

The manufacture of antiseptic dressings by the pharmacist.

Syrup of the hypophosphites.

The comparative value of yerba santa, liquorice and saccharin in masking the bitter taste of medicines.

Incompatibility of Fowler's solution with tincture of iron.

In addition to these several papers will be presented, containing statistical or pharmaceutical information on miscellaneous subjects.

A circular from F. B. Kilmer, Secretary of the section on commercial interests, states that the subject of "shorter hours" will, probably, be brought before that section, and invites an expression of opinion upon this question, from associations as well as from individuals.

The Committee on Arrangements, of which the Local Secretary, Mr. Charles E. Dohme, of Baltimore, is Chairman, has about completed the preliminary arrangements, of which the members will be informed by circular. The space for exhibits will be somewhat limited, and has nearly all been taken. The usual convention rates, one and one-third fare for the round trip, have been obtained; but since these tickets are good on the return trip only for a limited time, and are not available for stop-over, it is likely that most members from a distance will prefer the regular summer excursion tickets to Fortress Monroe or Old Point Comfort, which can be produced over numerous routes of travel, taking in many places of resort and interest.

As usual of recent years the first session will be called to order on Monday afternoon, at 3 P.M., and the last session will adjourn in the forenoon on the succeeding Friday. Propositions for membership should be sent to the Secretary of the Committee on Membership, G. W. Kennedy, Pottsville, Pa., as soon as possible, and credentials of delegates should reach the permanent Secretary early in August.

The Pharmaceutical Examining Board of Pennsylvania held an examination in the High School at Williamsport on July 8. The candidates for certificate of registered pharmacist were twenty-five, and for qualified assistant sixteen in number. Ten of each class were successful.

The Alvarenga Prize, of the College of Physicians of Philadelphia, consisting of one year's income of the bequest of the late Señor Alvarenga, of

Lisbon, has been awarded to Dr. R. W. Philip, of the Victoria Dispensary for Consumption and Diseases of the Chest, Edinburgh, for his essay on Pulmonary Tuberculosis, which will be published by the College.

The Sixth Centenary of the University of Montpellier was celebrated in that city in May last (see April number, p. 201), according to the programme previously arranged. We acknowledge the receipt of a pamphlet containing the discourses delivered on that occasion by the Rector, Professor Chancel, and by Professor Croiset, of the Faculty of Arts, the latter containing a historical review of the origin and growth of the University, and of the important events connected therewith during the six centuries of its educational labors.

The American Journal of the Medical Sciences.—We learn that with the completion of the July issue, Dr. I. Minis Hays has withdrawn from the editorship of the journal named, and that he will be succeeded in the editorial chair by Dr. Edward P. Davis. It does not frequently happen that a scientific journal of the standing and influence of the one named remains in the editorial care of father and son for sixty years, yet such has been the case with *The American Journal of the Medical Sciences.* The retiring editor has well succeeded in retaining for the *Journal* the high esteem of the medical profession, and in the hands of the new editor its reputation will, doubtless, not be permitted to decrease.

REVIEWS AND BIBLIOGRAPHICAL NOTICES.

Practical Sanitary and Economic Cooking adapted to persons of moderate and small means. By Mrs. Mary Hinman Abel. Published by the American Public Health Association. 1890. 12mo. pp. 182. Price, cloth, 40 cents.

This is the Lomb prize essay for 1888, selected out of seventy presented for competition. The committee making the award consisted of Prof. C. A. Lindsley, New Haven; Prof. G. H. Rohé, Baltimore; Prof. V. C. Vaughan, Ann Arbor; Mrs. E. H. Richards, Boston, and Miss E. C. G. Polson, New Haven. In their final report the committee stated, "that of all the essays submitted the one selected is not only pre-eminently the best, but that it is also intrinsically an admirable treatise on the subject. It is simple and lucid in statement, methodical in arrangement and well adapted to the practical wants of the classes to which it is addressed. Whoever may read it can have confidence in the soundness of its teachings, and cannot fail to be instructed in the art of cooking by its plain precepts, founded as they are upon the correct application of the scientific principles of chemistry and physiology to the proper preparation of food for man."

The book may be procured from the Essay Department of the American Public Health Association, P. O. Drawer 289, Rochester, N. Y.

The Suppression of Consumption.—By G. W. Hambleton, M.D., President of the Polytechnic Physical Development Society of Great Britain. New York: N. D. C. Hodges. 1890. 12mo. Price, 40 cents.

This is the first number of a series of essays which are being published under the general title of "Fact and Theory Papers." The subject indicated in the title is treated of in a plain and convincing manner.

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THE AMERICAN
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SEPTEMBER, 1890.

ON JALAP.

By J. Paul Suess, Ph.G.

The literature of jalap, of late years, has been tending towards the fact that the drug is deteriorating in the richness of its active constituent, resin. The writer's attention was forcibly called to this fact by a reprint, in the *Pharmaceutical Record*, of an article on "Compound Cathartic Pills, U. S. P.," by Prof. W. M. Searby, in which he proposes a formula for the pills in which resin of jalap is substituted for abstract. He says: "The substitution of resin of jalap, which I have used in the place of the abstract, is open to criticism. It is well known that the jalap which has come to market of late years has not contained nearly so much resin as we were accustomed to find in the drug 15 or 20 years ago. At the present time, the jalap of the market will not yield on the average more than about 9 per cent. of resin."

When we take into consideration the continued use of the drug, both in pills and powder, and the part it may be called upon to play in the treatment of disease, as employed especially by older practitioners, and the fact that the amount of resin contained in the drug, as variously stated in the books, is from "not less than 12" to 22 per cent., the assertion of Prof. Searby at once becomes of considerable moment to both the medical and pharmaceutical professions, especially at a time when our Pharmacopœia is undergoing revision.

With these facts in view, the writer obtained selected samples of the root from several reliable drug houses throughout the United States

—namely, from Philadelphia, 2; New York, 1; St. Louis, 1; San Francisco, 1; Peoria, 1. They were numbered, respectively, Nos. 1, 2, 3, 4, 5 and 6. Samples 1 and 5 were obtained in Philadelphia. The price varied from 22 cents to 80 cents per pound. The Chicago house of which inquiry had also been made for a sample of whole root did not respond, but advised the obtaining of samples from firms making the powdering of drugs a specialty; this suggested the getting of two samples in a powdered state.

REMARKS.—*No. 1.*—Root; rather small, of grayish color, horny texture, not very heavy—some pieces mealy.

No. 2.—Root; somewhat larger, rounded, dark-colored and resinous—a few pieces mealy.

No. 3.—Root; of good size, dark, resinous, with some tubers hollow.

No. 4.—Root; very fine specimens, large, some 4¾ inches long; generally thick and solid, dark-colored, heavy and resinous.

None of above samples were worm-eaten.

No. 5.—Powd. Root; of usual gray color and of weak odor of jalap.

No. 6.—Powd. Root; of somewhat darker gray color, with decided odor of the drug.

Manipulations.—The process of manipulation was the same as that contemplated by the revisers of our last Pharmacopœia. In each case 3,500 grains of the powdered drug was employed, excepting in the case of No. 4, where only 3,000 grs. were used. The root was first rasped, dried and then reduced to a fine powder; moistened with alcohol, sp. gr. 0·820 (60° F.), packed firmly in a long, narrow, cylindrical glass percolator. Enough alcohol was added to saturate the powder and leave a stratum above it, the lower orifice was closed, and the powder macerated for 3 days. Percolation was then continued until the powder was completely exhausted, and the last drops of liquid that passed were devoid of color, taste and odor of the drug, and produced no cloudiness when dropped into water. The alcoholic tincture thus obtained was evaporated to about 3 fl. oz. and precipitated with 4 pints of water, previously reduced to a temperature of about 50° F. After decanting the clear liquid from the precipitated resin, and repeated washings, the resin was carefully dried, weighed and separately preserved.

Ether-soluble Resin.—At the suggestion of Prof. Maisch the per

cent. of ether-soluble resin was determined. For this purpose 50 grains of each specimen of resin were digested in 2 fl. oz. of stronger ether, sp. gr. 0·725 (60° F.), for one month with almost daily agitation; the clear ethereal solution poured off and preserved in an accurately tared glass capsule. The operation was repeated twice more and the whole carefully evaporated, when the amount of ether-soluble resin was readily determinable.

Quantitative Results of Proximate Analysis.

No.	Form Employed.	Cost per Lb.	Amount used.	Per Cent. Resin.	Per Cent. Ether-soluble Resin.
		cts.	*grs.*		
1	Whole Root.	38	3500	7·285	14·0
2	" "	22	3500	9·285	10·0
3	" "	80	3500	11·000	9·0
4	" "	60	3000	14·500	8·0
5	Powd. Root.	40	3500	7·714	12·5
6	" "	50	3500	11·771	11·0
	Average, ...			10·269	10·75

It was noticed that the ethereal solutions of Nos. 2 and 5 were considerably deeper in color than any of the rest; and the deposit of ether-soluble resin, after evaporation, of Nos. 2, 3, 5 and 6, much darker in color than Nos. 1 and 4. Also, that No. 4, which was richest in the amount of resin, yielded the smallest quantity of ether-soluble resin.

From the foregoing analysis the writer is inclined to fully justify Prof. Searby's assertion, and feels admonished that the time has arrived when the revisers of the present Pharmacopœia should suggest the substitution of resin of jalap in place of the abstract in the formula for Pil. Carthartic. Comp., and make the pharmacopœial requirement of the root about 8 per cent. of resin.

WILLIAMSPORT, PA., August 5, 1890.

EXTRACTUM JALAPÆ ALCOHOLICUM.

BY JOHN ELMER WISHART, Ph.G.

Abstract from an Inaugural Essay.

Two samples of jalap root were procured, and after being reduced to No. 60 powder, four troy ounces of each were used for preparing the extract by percolation with 95 per cent. alcohol. The percolates

were evaporated to the consistency of soft extracts over a water-bath, dried at 105° C., weighed, and then exhausted with distilled water at 15·5° C. The watery extract was evaporated, dried and weighed. The remaining resin was then treated with stronger ether and the quantity of the ether-soluble portion determined by evaporation and weighing. The results were as follows:

Sample.	Alcoholic Extract.		Resin Per Cent.	Ether-Soluble Resin.
	Total.	Water-Soluble Portion.		
1	14·583 per cent.	2·816 per cent.	11·666 per cent.	12·765 per cent.
2	15·625 per cent.	4·239 per cent.	10·386 per cent.	9·523 per cent.

The resin was reddish-brown in color, No. 2 being of a darker shade; it had an acrid taste and a neutral reaction. One part of it dissolved in 50 parts of water of ammonia yielded a solution which did not gelatinize on cooling; on the addition of hydrochloric acid in excess a precipitate was produced.

Jalapurgin, the resin remaining undissolved by the ether, was brittle, reddish-brown, of a sweetish, afterward acrid taste, and of neutral reaction. It was soluble in alcohol, chloroform and in potassium hydrate solution, the latter solution having a peculiar odor.

The ether-soluble resin was reddish-brown, soft, did not harden on standing, and was soluble in alcohol and potassium hydrate, the latter solution yielding a precipitate on being acidulated with hydrochloric acid.

Resin of jalap was also prepared by the pharmacopœial process by exhausting the powders with alcohol, concentrating the percolate to a small bulk, precipitating with water, washing the precipitate and drying at 105° C. The amount of resin thus obtained was 9 79 per cent. from sample No. 1, and 8·75 per cent. from sample No. 2. The smaller yield by this process is, probably, mainly due to the more complete removal of the extractive matter soluble both in alcohol and water.

Jalapurgin, as obtained above, when treated with potassium acid chromate and sulphuric acid, took an olive-green color, while the

ether-soluble resin became at first yellowish-brown, and subsequently changed to reddish-brown. Treated with manganic dioxide and sulphuric acid, jalapurgin acquired a rose-pink, but the ether-soluble resin a dark green color.

ABSTRACTS FROM THESES.

Contribution from the Chemical Laboratory of the Philadelphia College of Pharmacy.—No. 77.

H. L. Hurxthal, Ph.G., examined four brands of *commercial Codeine*, and found them to agree closely with the requirements of the U.S.P., except that they all gave rather dense precipitates with mercuric chloride, while our Pharmacopœia states that no such precipitate should form. As, however, there is abundant authority for the statement that codeine should give a precipitate with mercuric chloride, our standard is evidently in error on this point.

Codeine has recently been much advertised as a cure for the opium habit, and one brand in particular has been extensively advertised as being especially adapted for this purpose on account of its great purity. In all the tests applied, there was no evidence in favor of any special manufacture.

The water present was very near the theoretical 5·6 per cent.

No. 1 gave on drying			5·1	per cent.	water.
No. 2	"	"	5·3	"	"
No. 3	"	"	5·6	"	"
No. 4	"	"	5·6	"	"

These residues, after drying, gave the following melting points: No. 1, 150·2° C.; No. 2, 150·1° C.; No. 3, 149·7° C.; No. 4, 149·7° C.

The determinations were made with a thermometer corrected at the Yale Observatory, and closely agree with the U.S.P. requirement of "about 150°." In Beilstein's Organic Chemistry, vol. iii, page 554, the melting points 153° and 155° are quoted, the former on the authority of Grimaux, and the latter on that of Hesse.

Leonard A. Schoppe, Ph.G., investigated a sample of "*artificial gum*," used and sold as a substitute for acacia. In appearance it resembled granular acacia somewhat, but the granules were larger and more transparent. It also differed in having a sweet and only slightly mucilaginous taste.

It was slowly and completely soluble in cold water, forming a neutral solution.

A 10 per cent. solution in water was not precipitated by an equal volume of 95 per cent. alcohol; on adding 1½ volumes it was partly precipitated, and 3 volumes precipitated 67 per cent., which amount was not increased by the further addition of alcohol. It was at first supposed to be a mixture of true gum and sugar. There were found 39 per cent. of total sugar, 11 per cent. of which was directly reducible by Fehling's solution, 7 per cent. of moisture, leaving 54 per cent. to be accounted for as gum. As the ash was only ·04 per cent., the presence of that much acacia was out of the question, since 5 or 6 specimens of true acacia were found to yield an average of 3 per cent. of ash. It was also found that longer boiling with acid would give a larger percentage of sugar. It was concluded that this gum was made by a careful treatment of starch with sulphuric acid, so as to partly convert the former, and the acid neutralized with lime, as the ash was found to consist of calcium sulphate.

MICROSCOPICAL NOTES.

By Hans M. Wilder.

Starch.—On heating it in the presence of water, paste will finally be formed, but this formation does not take place in strong alcoholic liquids, fluid resins (for instance, benzol-balsam) or in essential oils, heating in which liquids does not destroy the individuality of the starch grains. Although cold, moderately strong solutions of potassa or soda soon convert starch into paste, water of ammonia apparently exerts no influence. Carbolic acid destroys it quickly.

Experiments.—As soon as the student of microscopy gets somewhat familiar with the usual methods of mounting, he will, likely enough, try to modify them or, perhaps, strike entirely new paths —that is but human nature. Now, the advice which the writer wants to give is to make a note of every departure from the old methods, however apparently insignificant it may seem to be. The best way is merely to number each slide, etc.; and in a note-book kept for this purpose to enter under that number all necessary remarks. In case the experiment turns out to be a success, these remarks will enable one to repeat it; if the experiment happens to be a failure, the remarks will save much disappointment and loss of

time in the future. The writer was led to this paragraph by several slides, made about a year ago, of which he cannot form the faintest idea of how he made them (previous treatment of substance, stain, medium, etc.), and some of these he should very much like to duplicate.

"*Festina lente*"—Make haste slowly! Hurry seldom gives good results; take your time in the previous treatment, staining, mounting, etc.

Stains.—These serve a two-fold purpose: First, to make more easily visible extremely thin, colorless and transparent elements (tissues), either directly by staining them, or indirectly by staining the surrounding medium. Secondly, to differentiate the component elements of the object, so as to render them more readily recognizable. This is done with single stains by the different selective power which the various elements possess, some of the latter either not taking the stain at all, or with varying intensity, or with different colors. Double stains act, of course, by selection. For cursory examination the most generally useful single stains are: Methyl violet (purple ink), hæmatoxylin and sulphindigotate of sodium (Arnold's writing fluid does as well); all of which give better results if used much diluted, using longer time. Carmine gives excellent stains, where suitable, but is somewhat troublesome to use properly.

Microscope stands.—These may conveniently be divided into two great classes: Those with facilities for applying substage apparatus, and those without such facilities. The latter class is the cheapest (as low as $15 with sliding tube), and will do for the first year or two, but since it is impossible to use a polarizing apparatus with them (and pharmacists have quite often use for it), not to mention sundry other pieces of apparatus, the student will sooner or later be forced to either sell his instrument or to exchange for a stand of the first class, either of which means loss of money. It is, therefore, better from the start to get one of the first class. This class may be subdivided into those where the substage apparatus is fastened to a fixed ring under the stage, and those where the ring is movable on the mirror-bar. The latter stands are certainly the handiest, but cost more (from $30 up); the first ones (with fixed ring) serve all the purposes of even exacting pharmacists, and are much cheaper as low as $18, with sliding tube). Whatever stand is chosen, it is indispensable that the draw-tube be provided with society screw.

Whether sliding tube or rack and pinion, is merely a matter of convenience and dollars and cents.

German vs. American Microscopes.—With 45 per cent. duty the American instruments are, dollar for dollar, superior to German ones at the same price; of late several American firms have been making stands according to the squat German model for those who prefer short stands.

Book.—Next to a living teacher comes a good manual, and the writer knows of none better or more instructive handbook of microscopical technique than the *Technical History of a Slide*, by Dr. Frank L. James, St. Louis, Mo. He generally gives the "why" and "wherefore" of every step.

Patience.—Without much patience and a corresponding amount of failures few will become expert microscopists. Through failures we learn!

CHEMICAL NOTES.

By Henry C. C. Maisch, Ph.G., Ph.D.

On Cocaine.—A. Einhorn and A. Marquardt (*Ber. d. Deutsch. chem. Gesell.*, 1890, 468) treated ecgonine with potassium hydrate and obtained an isomeric base which is dextrogyre while ecgonine is lævogyre. On treating the methyl ether of this base with benzoyl-chloride a dextrorotary alkaloid isomeric with cocaine was obtained. The alkaloid which C. Liebermann and Giesel noticed in the technical synthesis of cocaine and which they named *methyl-cocaine* (*Ber.*, 1890, 508) seems, according to newer investigations, to be identical with the above alkaloid (*Ber.*, 1890, 926).

The first-named author, A. Einhorn, has succeeded in going from a derivative of cocaine, *anhydroecgonine* C_5H_7 (CH = CH—COOH)NCH_3, to one of atropine, *tropidine* C_5H_7 (CH = CH_2) NCH_3 by heating anhydroecgonine with concentrated hydrochloric acid to 280° C. for 8 hours. Among others there is one base formed which yields a gold salt, melting at 212° C. On decomposing this double salt or better the picrate, a base $C_8H_{13}N$ is obtained, which proved to be tropidine. (Ber., 1890, 1338.)

On Cinchonamine.—Arnaud (*Ann. Chim. Phys.* (6) *19* (1890) 93) among other things, in reviewing his work done on this new cinchona alkaloid, gives the following method for estimating nitric acid based on the slight solubility of cinchonamine nitrate. The solu-

tion containing the nitric acid is carefully neutralized with sulphuric acid or sodium hydrate, chlorides are precipitated with silver acetate and the excess of the acetate removed with sodium phosphate. The filtered solution is evaporated almost to dryness, filtered if necessary, slightly acidified with a drop of dilute acetic acid and precipitated while boiling with a warm solution of cinchonamine sulphate. Precipitation takes place immediately, but the solution is set aside in a cool place for twelve hours. The precipitate is then collected on a weighed filter, washed with a cold saturated solution of cinchonamine nitrate (to remove the excess of sulphate) and washed with a small quantity of cold water. The filter is then dried at 100° C. and weighed. 359 pts. by weight of the nitrate represent 54 pts. N_2O_5. A solution containing $\frac{1}{1000}$ potassium nitrate still yield a precipitate after standing several hours.

The Carbohydrates of the Sweet Potato (*Batatas edulis*).—W. E. Stone (*Ber. d. Deutsch. chem. Gesell.*, 1890, 1460) found 1½ to 2 per cent. of cane sugar and a large amount of starch.

Myrrh.—O. Köhler (*Arch. d. Pharm.*, 1890, *228*, 291) examined this gum resin of the Sumali country. Distillation with water yielded the oil $C_{10}H_{14}O$, 7 to 8 per cent. The residue was dried and treated with absolute alcohol where the gum remained. This has the composition $C_6H_{10}O_5$, is a light yellow or white powder soluble in water, and is present to the amount of 57 to 59 per cent. The portion soluble in alcohol, which is 33 to 35 per cent. of the whole, contains (1) a soft resin $C_{26}H_{34}O_5$ soluble in alcohol and ether and has three free hydroxyls, and (2) two dibasic resin acids $C_{13}H_{16}O_8$ and $C_{26}H_{32}O_9$.

The Phenol of Oil of Sassafras.—C. Pomeranz (*Monatsh. f. Chem.*, 1890, 101) separated the phenol by shaking the oil with dilute potassium hydrate, precipitating with sulphuric acid, drying and purifying by distillation. Analysis and other properties point toward eugenol, which was verified by preparing and examining the benzoic ester.

Test for Purity of Lard.—F. Jean (*Société chim. de Paris*, June 6, 1890, through *Chem. Zeit.*, 1890, 945) uses the rotatory power of lard, which is 12·5° for detecting adulterations. He claims that 5 per cent. of foreign fat, cotton-seed oil or margarin, can be detected with the polariscope.

Oils of Nutmeg and Mace.—F. W. Semmler (*Ber. d. Deutsch.*

Chem. Gesell., 1890, 1803) found oil of nutmeg, obtained from Schimmel & Co. to contain only terpenes. The oil examined was colorless, specific gravity at 15° C. = 0·8611. The terpenes, the oil contains several, boil at about 50° C. under 8 mm. pressure. The oil of mace examined was yellow, specific gravity at 14° C. = 0·9309; neither at ordinary temperature nor on cooling to — 10° C. is a solid deposited. The raw oil gives an emerald green color with alcoholic ferric chloride. Distillation at 10 mm. yielded fractions: 35–70°, 53 per cent., is colorless, gives no color reaction with ferric chloride and its specific gravity is 0·8601. This fraction consists of terpenes like those of oil of nutmeg. Wallach found pinene and dipentene. Fraction, 70–114°, 15 per cent., contains myristicol and a small quantity of terpene, is colorless, gives no color reaction, and has the specific gravity 0·9131 at 12° C. Fraction remaining in the flask at 114° C., 31 per cent., partly crystallizes on cooling, is dark yellow, gives the color reaction with ferric chloride and has the specific gravity 1·0863 at 12° C. This higher boiling fraction was furnished the author by Schimmel & Co., and was further examined by him. The properties were the same as those noted above. It is soluble in concentrated sulphuric acid with a blood red color, and its specific gravity at 14° C. was 1·1303. On distillation the first drop goes over at 124° C., the principal portion distilling from 148° to 158° C. The color reaction probably being due to a phenol, the oil, to separate this, was treated in vacuum with sodium while cooling, and when the reaction has subsided the liquid must be warmed. Distillation is then carried on at 10 mm. pressure when the oil goes over from 142° to 149° C. On cooling the oil solidifies, ferric chloride yields no color nor has sodium any effect. The specific gravity at 25° C. is 1·1501, and the melting point 30·25° C. Analysis and vapor density determination point to the formula $C_{12}H_{14}O_3$; the author named this stearopten *myristicin*, which is *not* identical with the body formerly known under that name and which Flückiger found to be myristic acid. Sodium being without affect, the myristicin is very likely an ether.

Balsam of Peru has given excellent results to Dr. Jasinski in cases of local tuberculosis of the bones and skin. It was used in substance or in alcoholic solution as a dressing and as injection into cavities.—*Med. News*, May 10, p. 511.

GLEANINGS FROM THE GERMAN JOURNALS.

By Frank X. Moerk, Ph.G.

Preservation of Infusions.—At a pharmaceutical meeting in Christiania, Norway, Dr. E. Larsen exhibited specimens of various infusions—notably digitalis—which were several months old, and had not undergone any changes; the infusion of digitalis was still found to be very effective. The method of preservation was to simply sterilize the infusion and afterwards prevent the introduction of germs; this was accomplished as follows: The infusion was placed in a flask with a doubly perforated cork containing a short, straight tube closed with a plug of cotton, and a syphon-tube with a short piece of rubber and pinch cock, the glass syphon-tube reaching to the bottom of the flask; to sterilize, the infusion is boiled so that steam passes through the cotton for one-half minute, by closing the short tube with a cork for a moment, the syphon-tube being open, the latter fills with the infusion; allowing the pinch cock to close the syphon-tube and removing the cork from the short tube, the infusion can be removed at will, simply by opening the pinch cock; the cotton preventing any germs from entering the flask, but allowing filtered air to take the place of the infusion.—*Pharm. Centralhalle*, 1890, 405.

Glycerinum saponatum, a solution of soap in glycerin is used by von Hebra as a base in various dermal remedies. The soap used is a perfectly neutral cocoanut oil-soda soap or tallow-soda soap, dried at 80°–100° C. The soap is dissolved in glycerin sp. gr. 1·25, using a water bath, and the solution filtered hot; after cooling it forms a pale yellow, odorless elastic mass, melting at the temperature of the body; completely soluble in water it can be used as a base for ointments as well as for lotions; it is hygroscopic and must be preserved in closed vessels. The most useful preparation contains 20 per cent. soap, although, for some purposes, 8 per cent. soap is more desirable. In making medicated preparations the glycerinum saponatum is melted and the medicinal agents incorporated or dissolved.

For the following combinations 80 per cent. glycerin and 20 per cent. soap is used: with *salicylic acid*, 5 per cent.; useful in softening hard skin on hands or feet; *with salicylic acid and resorcin*, 5 per cent. of each; *with salicylic acid and creasote*, 5 per cent. of each; *with salicylic acid and tar*, 3 and 10 per cent.

With 92 per cent. glycerin and 8 per cent. soap are prepared:

Glycerinum saponatum with zinc oxide (95 : 5), forms a fine white mass, permanent in air; it is so firm that it must be scraped with a spatula, but placed upon the skin it softens and can be rubbed up completely, especially in presence of a little water. It is used for chapped hands; for eczema the following is more desirable: Glycerinum saponatum 78, zinc oxide 20, and starch 2.

Glycerinum saponatum with iodoform (95 : 5); much more iodoform can be introduced. It forms a hard mass, which must be scraped with a spatula; placed upon sores it liquefies and penetrates into all parts of the wounds. There is noticeable in the preparation a marked reduction of the iodoform odor.

Also combinations *with sulphur*, 10 per cent.; with *sulphur and zinc oxide*, 10 and 20 per cent. respectively; *with chrysarobin*, 10 per cent.; *with hydroxylamine*, 1 per cent.; *with ichthyol*, 5 per cent. of the ammonium salt; with *ichthyol* and *zinc oxide*, 10 per cent. of each; *with carbolic acid*, generally 2 or 3 per cent. of the latter.—(*Ztschr. f. Therap.*) *Pharm. Centralhalle*, 1890, 415 and 444.

Ozonin, a bleaching fluid, patented by L. Schreiner, is made as follows: 125 parts resin are dissolved in 200 parts oil of turpentine; to this solution is added a solution of 22·5 parts potassium hydrate in 40 parts water, also 90 parts hydrogen peroxide. The resulting jelly exposed to light changes in 2 or 3 days into a thin fluid called *ozonin;* this same change takes place in the dark, but then requires some weeks for its completion. An emulsion of one gram ozonin in one liter water acts as an energetic bleaching agent on fibres, wood, straw, cork, paper; also, on solutions of gums and soaps; the bleaching effect is as energetic in acid as in alkaline solutions.—*Chemiker Ztg.*, 1890, 1004.

Codeine phosphate appears in commerce of various composition. By neutralizing codeine with phosphoric acid and crystallizing from water, or precipitating the solution with alcohol, the salt had the composition $C_{18}H_{21}NO_3H_3PO_4 + 2H_2O$; but if crystallized from hot dilute alcohol $2(C_{18}H_{21}NO_3H_3PO_4) + H_2O$. Both are found among the commercial article.—E. Schmidt, *Apoth. Ztg.*, 1890, 366.

Benzosol, the benzoic ether of guaiacol, has been prepared by Dr. Bongartz and recommended as a tasteless substitute for the locally irritating guaiacol. Taken into the system it is slowly saponified by the gastric juice and the liberated guaiacol is under the most

favorable conditions for absorption. It has the formula $C_6H_4(OCH_3)O{\cdot}COC_6H_5$. For its preparation crude guaiacol is converted into the potassium salt, which is then purified by crystallization from alcohol; heated with the calculated quantity of benzoyl chloride the potassium-guaiacol forms benzosol and potassium chloride. After recrystallization from alcohol it forms small colorless crystals, melting at 50°, almost odor- and tasteless, insoluble in water, but soluble in alcohol and ether.—(*Südd. Ap. Ztg.*) *Apoth. Ztg.*, 1890, 389.

The specific gravity of waxes, resins and solid fats is easily and rapidly determined by taking a cylindrical piece 1–1·5 cm. long and 0·5 cm. diameter (made by pouring the melted substance into a proper mould), weighing it, placing it in a dry, narrow-necked small flask of known capacity and allowing water to run in from a burette; the substance should lay horizontally in the flask, so that when the water is added it does not rise into the neck of the flask. The weight of substance divided by its own volume of water gives the desired specific gravity. If the weight of the substance is 0·624, the capacity of the flask 25 cc., and after introducing the fat only 24·3 cc. water are required to fill the flask up to the same point, then $\frac{0{\cdot}624}{0{\cdot}7} = 0{\cdot}891$ is the specific gravity. The temperature should be kept at 15° C. during the determination.—Gawalowski (*Oel u. Fett Ind.*) *Pharm. Ztg.*, 1890, 427.

Detection of Nitrates in Iodide of Potassium.—0·1 gm. potassium iodide and 1·0 gm. copper sulphate are dissolved in 10 cc. water, heated to the boiling point, sulphurous acid added until the brown precipitate becomes white and filtered. The filtrate can then be tested for nitrate with sulphuric acid and ferrous sulphate.—Schürholz, *Pharm. Ztg.*, 1890, 427.

Honey.—Dr. Oscar Haenle, after long series of experiments, announces the discovery of a method enabling the recognition of a pure or adulterated honey. It is based upon the dialysis of the honey diluted with water and after some hours, testing the liquid in the dialyzer by polarized light; no matter if the pure honey is dextro- or lævogyre, after dialysis it is found that the liquid remaining in the dialyzer will be inactive; adulterated or artificial honey, on the other hand, always will leave a dextrogyre liquid in the dialyzer, no matter how long the diffusion is allowed to proceed. The rotatory power is due to dextrin or dextrin-like bodies present

in the glucose used for adulteration. To insure reliable results, the liquid is tested from hour to hour until the rotation remains constant.—*Pharm. Ztg.*, 1890, 441.

Mucilage of Gum Arabic.—To make a clear, almost odorless and permanent mucilage Francke neutralizes the free acid present in the gum with lime water. Instead of water he uses a mixture 20 per cent. lime water and 80 per cent. distilled water.—*Pharm. Ztg.*, 1890, 457.

Atropamine is a new alkaloid found by Hesse in belladonna root, where it is occasionally present in considerable quantity. It is amorphous, melts at 60° C., is easily soluble in alcohol, ether and chloroform, has the formula $C_{17}H_{21}NO_2$ (differing from atropine, hyoscyamine and hyoscine by containing one H_2O less; but, identical with pure belladonnine). It differs from the other belladonna alkaloids by forming beautifully crystallized haloid salts; it is optically inactive; the hydrochlorate in 2 per cent. solution is not mydriatic. Atropamine is only decomposed by prolonged boiling with alcoholic baryta solution, yielding tropine and an unknown acid, which may under some conditions re-arrange its atoms to form cinnamic or isocinnamic acid. Mineral acids easily bring about the decomposition but first convert the atropamine into belladonnine; this easy decomposition may explain why the alkaloid was not sooner discovered as it is easily isolated. It is precipitated from its salts by ammonia, potash and soda as oily drops.—*Pharm. Ztg.*, 1890, 471.

Precipitated red oxide of mercury.—The publications of Vielhaber and Jehn that the red oxide of mercury made from the nitrate was often, if not always, contaminated with metallic mercury induced Dr. Bosetti to attempt its preparation by precipitation. By using a boiling solution of mercuric chloride (1 : 4), adding baryta solution until the brown precipitate turns red, and washing, red oxide was obtained. The objection to the product is that while free from chlorine, it always contains baryta. A red oxide of deep orange color can be obtained by using NaOH in place of $Ba(OH)_2$, avoiding an excess of NaOH. Like the officinal red oxide it does not change its color if warmed on a water-bath with oxalic acid solution.—*Pharm. Ztg.*, 1890, 471.

Nux Vomica Assays.—10 gm. of the powdered seeds are exhausted in an extraction apparatus with a mixture of 75 parts chloroform and 25 parts spirit of ammonia, the chloroform recovered by distillation, the residue, after dissipation of the

alcohol, taken up with a mixture of 5 cc. each of water, alcohol and 10 per cent. aqua ammoniæ and this solution extracted three times with 20, 10 and 10 cc. chloroform respectively. The chloroform is distilled off, the residue, freed from ammonia by heating on a waterbath, is dissolved in 15 cc. $\frac{1}{10}$n hydrochloric acid, the solution warmed for 5 minutes on a waterbath, filtered, the filter washed with hot water until the washings are free from acidity and the excess of acid determined with $\frac{1}{100}$n soda solution. By subtracting the required cc. of NaOH from 150, the number of cc. of $\frac{1}{100}$n HCl required to neutralize the alkaloids in 10 gm. seeds is obtained. 1 cc. $\frac{1}{100}$n HCl corresponds to 0·00367g alkaloid assuming strychnine and brucine to be present in equal proportion. In ten determinations the results varied between 2·17 per cent. and 2·38 per cent.

Nux vomica obtained from different countries were examined to ascertain the alkaloidal percentages: Bombay, 2 samples, 2·33 and 2·30 per cent.; Malabar, 1 sample, 2·62 per cent.; Cochin, 3 samples, 2·51 per cent, 2·41 per cent. and 2·81 per cent.; Madras, 2 samples, 3·42 per cent. and 1·53 per cent.; Calcutta, 1 sample, 2·40 per cent.

Extract of Nux Vomica is assayed by dissolving 2 gm. of the extract in 5 cc. each of water and water of ammonia and 10 cc. alcohol and agitating with chloroform, etc., as above.

Tincture of Nux Vomica.—50 cc. are evaporated to dryness and proceeded with under the extract.

To determine relative percentages of brucine and strychnine, the total alkaloids must be purified; this is accomplished by evaporating the solution of the mixed alkaloids from the total alkaloid estimation to dryness after addition of some ammonia, dissolving the residue in alcohol with the aid of heat, filtering, evaporating to dryness, redissolving in water containing HCl, adding ⅓ alcohol to the solution, and an excess of ammonia and agitating with three portions of chloroform of 20, 10 and 10 cc. respectively. The residue from the chloroform solutions is taken up with $\frac{1}{10}$n HCl and its excess determined with $\frac{1}{100}$n NaOH. From the quantity of acid required the total alkaloid remaining after purification is calculated. The solution is evaporated to 25 cc., strongly acidulated with HCl, and then precipitated with a one per cent. solution of potassium ferrocyanide (the value of which has been definitely ascertained by use of a weighed quantity of strychnine) until a drop of the solution

placed upon ferric chloride paper gives a blue color. From the cc. $K_4Fe(CN)_6$ is calculated the amount of strychnine and the cc. $\frac{1}{100}$n HCl equivalent to it. The cc. $\frac{1}{100}$n HCl corresponding to strychnine is subtracted from the cc. $\frac{1}{100}$n HCl necessary for the purified total alkaloids and the remainder multiplied by 0·00394 gives the quantity of brucine. From these relative quantities are then calculated the percentages of the two alkaloids. There is a loss in purifying the alkaloids, but this by experiment has been found not to alter the relative percentages of the two alkaloids. In five extracts examined the ratio of strychnine and brucine varied from 42 : 58 to 54 : 46. Taking a normal extract with 15 per cent. total alkaloid the percentage of strychnine might vary from 6·3 per cent. to 8·1 per cent., or 1·8 per cent. If the physiological action of strychnine and brucine is as given by Falk 1 : 38·5 then little is accomplished by a total alkaloid determination; it would be more to the point to require a fixed percentage of strychnine and disregard the brucine (of which an equal quantity could always be assumed). An extract with fixed strychnine percentage and a brucine percentage varying within 1·8 per cent. is undoubtedly more reliable than an extract containing a fixed quantity of total alkaloid in which the strychnine present might vary 1·8 per cent.—H. Beckurts, *Arch. der Pharm.*, 1890, 330–347.

REMARKS ON QUININE, CINCHONIDINE AND THEIR ISOMERS.[1]

By Dr. O. Hesse.

It has recently been suggested that there is need of more accurate determinations of the melting points of anhydrous quinine prepared in different ways, and as the data specially referred to were those obtained by Dr. Hesse he has repeated his previous observations, and in publishing his results has taken the opportunity to add some remarks in reference to the corresponding varieties of cinchonidine.

Dr. Hesse had given two data for the melting point of anhydrous quinine, one relating to precipitated alkaloid that had been dried in an exsiccator, the other to anhydrous quinine obtained by direct crystallization. In the latter instance the observed melting point,

[1] *Annalen der Chemie*, vol. cclviii, p. 133. Reprinted from *Phar. Jour. and Trans.*, July 12.

177° C., was given, and in the former the corrected temperature 176·8° C. The correction may have amounted to 3 or 4 degrees, so that the observed temperature would have been about 173° C. According to these observations the melting point of the anhydride would be decidedly the higher. The difference may, however, have been due to defects in the thermometers used, and Dr. Hesse has therefore tested the thermometer used in his latest observations by comparing it with a normal instrument in the Physicotechnica Institute at Charlottenburg and in addition has made use of Roth's apparatus to prevent any possible error. Although this apparatus does not give at once the absolute melting point, the direct observation is such a close approximation to it that the differences are within the limit of observation, error and correction may therefore be dispensed with.

Of the two preparations previously operated with only the quinine anhydride was available for further examination and that gave in several experiments a melting point of 174·4° to 175° C.

The trihydrate prepared for the other determination was crystallized from dilute alcohol in long silky needles. The anhydrous alkaloid obtained from it by drying in an exsiccator, and finally at a temperature of 120° C., melted at 172° C. The same substance was also obtained in compact needles by crystallization from ether, and after drying is melted at 171·2° to 172° C. The same hydrate prepared by precipitating a dilute water solution of quinine sulphate with caustic soda and also with ammonia gave after drying at 115° C., as the melting point of the dry base 172° and 171·4° respectively. Lastly, the base obtained by heating the benzene compound $C_{20}H_{24}N_2O_2C_6H_6$ to 120° C., until free from benzene, gave from 171·6° to 172° C.

The melting point of the anhydrous base obtained by direct crystallization is therefore on the average 174·7° C., and that of the base obtained by heating the trihydrate or the benzene compound is about 171·8° C. In some recent experiments Lenz found the melting point of the base obtained from the benzene compound to be 171° C., that of pure quinine obtained by precipitation being from 170·4° to 174·4° C. and he suggested that the differences might be due to a mixture of amorphous and crystalline quinine, but it was probably in most instances a mixture of ordinary quinine with the higher melting anhydride that he operated upon. The anhy-

dride is formed when solutions of quinine in certain indifferent solvents, such as dilute alcohol, are exposed for a long time to a temperature of 30° C.; and it is again converted into ordinary quinine when subjected to the continued action of dilute sulphuric acid. When the anhydride is dissolved with moderately warm dilute sulphuric acid in the corresponding molecular proportions, only ordinary quinine sulphate crystallizes on concentrating the solution, so that there is in that case a rapid conversion of the one form of base into the other.

In addition to the former statement of the differences between ordinary quinine and the crystalline anhydride Dr. Hesse adds that, as he then suggested, they are to be regarded as isomeric forms of this base, and in order to distinguish them he proposes to call the higher melting base homoquinine. Although this name has already been applied by Howard and Hodgkin to a substance that afterwards proved to be a compound of quinine with another base, its appropriation in that sense has now been done away with.

The relations between cinchonidine and homocinchonidine are similar to those obtaining between quinine and homoquinine. The confusion of those two bases that is still met with in chemical literature makes a brief reference to the history of both substances desirable. In 1877, Dr. Hesse showed the difference between these bases by the behavior of their neutral sulphates, but assigned to homocinchonidine the formula $C_{19}H_{22}N_2O$, that is now adopted, and to cinchonidine the old formula $C_{20}H_{24}N_2O$, expecting that his further investigations would clear up this point.

Anticipating that result, however, Skraup and Vortmann published a paper on "cinchonidine," in which, contrary to their intention, they dealt with homocinchonidine instead of cinchonidine, and it was not until a later period that Skraup recognized the identity of homocinchonidine with the base to which Dr. Hesse had given that name. The fact that Skraup and Vortmann were working with homocinchonidine, and not as they thought with cinchonidine, is shown by their misinterpretation of a statement as to the solubility of homocinchonidine in ether attributed to Koch by Skraup, but which was never made by Koch. In consequence of this misunderstanding, Skraup and Vortmann got rid of the cinchonidine, and retained the homocinchonidine, which they examined and described as being cinchonidine.

Hence it follows that the existence of homocinchonidine was not placed in doubt, as de Vrij has supposed, by the paper of Skraup and Vortmann, but on the contrary it was proved, and it was really the existence of the base to which Dr. Hesse gave the name of cinchonidine that was disputed. Subsequently, indeed, Skraup endeavored to prove the non-existence of this latter base by means of preparations obtained from Dr. Hesse. In regard to that attempt it is a sufficient justification of Dr. Hesse's view that two years ago de Vrij unintentionally supported the existence of the base which Dr. Hesse had named cinchonidine by making known a simple method of preparing it.

In reference to this communication of de Vrij's, Dr. Hesse mentions that he had from time to time prepared the tetrasulphate originally described by him, recrystallizing it from dilute sulphuric acid or from alcohol, then neutralizing the water solution, and separating from the sulphate deposited the still adhering homocinchonidine by means of recrystallization from water in the manner that has been described. A pure cinchonidine salt may be obtained even by repeated recrystallization of the tetrasulphate from dilute sulphuric acid or alcohol, as shown by Dr. Hesse more than ten years ago, so that this fact was already known in 1887 when de Vrij supposed it had been discovered by Schäfer. The uncorrected melting point of cinchonidine was found, as previously stated by Dr. Hesse, to be from 199·7° to 200·5°C. (mean about 200·1° C.), when determined by the method then in use (Clauss gives 201° C., Schäfer 199°), and that of homocinchonidine was found to be from 205° C. to 206° C., or nearly six degrees higher than the melting point of cinchonidine. By the use of Roth's apparatus the melting point of cinchonidine was found to be from 202° C. to 202·8° C., mean 202·4° C., and that of homocinchonidine from 207° to 208·2° C., mean 207·6°. By the same means, Lenz, without attempting a separation of homocinchonidine from cinchonidine, found the melting point of the base obtained from once recrystallized tetrasulphate to be from 207° C. to 207·5° C., that of twice recrystallized salt 204·5° to 205° C., and that of the base crystallized from ether 205° C. to 206° C., while that of a sample of cinchonidine obtained from Dr. Hesse was found to be 204·5° C. to 205·2° C., or in all instances higher than that of cinchonidine. Whether these differences were due to the presence of some homocinchonidine or to other circumstances it

is impossible to say, but in any case the mean values of 205·1° C. and 207·2° C. (corrected) adopted by Lenz for cinchonidine and quoted in Beilstein's "Handbook," are to be rejected as inappropriate.

When pure cinchonidine is dissolved in moderately warm sulphuric acid containing 25 per cent. H_2SO_4, in the proportions of 1 gram to 8 cc., the greater part crystallizes on cooling the solution in the form of tetrasulphate, and on examination of the base obtained from that salt as well as from the mother liquor both will be found to have the same melting point as the original base; under those conditions there is no alteration of the base. When homocinchonidine is treated in the same manner there is a similar though not quite so large a crystallization, but in this case the base separated from the mother liquor has a melting point of about 206° C. and that obtained from the crystals melts at 203° to 204°. By further recrystallization of the salt from dilute sulphuric acid pure cinchonidine tetrasulphate may easily be obtained. When the same treatment is applied to the base obtained from the mother liquor a further quantity of cinchonidine tetrasulphate is obtained. By this means it is not difficult to convert almost entirely into cinchonidine the homocinchonidine remaining in the last mother liquor together with some cinchonidine.

On the other hand, cinchonidine may be easily converted into homocinchonidine. When the above-mentioned solution is heated in a closed tube to 140° C. for six or eight hours no crystallization takes place on cooling, and it is easy to ascertain from the melting point of the base in that case and from the behavior of the neutral sulphate, that homocinchonidine is present. The acid solution will often remain for several days in this condition; after a time crystallization commences and proceeds more or less rapidly, indicating the reconversion of homocinchonidine into cinchonidine. The change may be accelerated by dropping a crystal of cinchonidine tetrasulphate into the solution, and thus it is perfectly easy to prepare homocinchonidine from cinchonidine or the reverse.

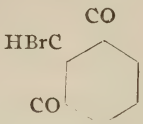
The two bases are distinguishable, apart from other differences, by their melting points being nearly six degrees different; but the statements published as to this particular might still more differ from each other if the melting points are not determined in the same manner. Dr. Hesse's former data of 199·7° to 200·5° apply to

the uncorrected melting point of cinchonidine determined according to the method then adopted, while Skraup and Vortmann give 210·5° as the corrected melting point of their cinchonidine that was in fact homocinchonidine. In several handbooks both substances have, in consequence of the statement of Skraup, de Vrij and others, been confused together under the name of cinchonidine, and thus there have naturally been great differences between the statements as to melting point. Dr. Hesse, however, disclaims responsibility for these discrepancies, since he has repeatedly insisted upon the difference between the two bases and their melting points.

The above-described conversion of cinchonidine into homocinchonidine calls to mind the β-cinchonidine which Dr. Hesse obtained under similar conditions from cinchonidine by means of hydrochloric acid. It had a melting point from 206° to 207° C., but then became brown, polarized in acid solution rather more strongly than homocinchonidine, and gave a neutral sulphate having great similarity to homocinchonidine sulphate, but much more soluble in water than it is. A small quantity of this base that still remains has meanwhile become yellow-colored. Both cinchonidine and homocinchonidine prepared at the same period have remained for ten years quite colorless; and it is therefore probable that the discoloration was due to some admixture which was not removed. Lenz also observed that his cinchonidine became somewhat brown on melting, though this is never the case with the pure base. If the above-mentioned β-cinchonidine was, as Dr. Hesse conjectures, chiefly homocinchonidine, it would be possible to reconvert it into cinchonidine as already described, and that was found to be the case, nearly three-fourths of the substance separating in the form of tetrasulphate, which could easily be recognized as a cinchonidine salt. From this observation it must therefore be inferred that by heating cinchonidine with hydrochloric acid of 1·125 sp. gr. to 140° C. the base is at first converted into homocinchonidine, which is then further changed into apocinchonidine. When sulphuric acid of the suitable strength is used this alteration does not proceed beyond the first stage.

The behavior of these bases strikingly recalls that of the mutually convertible bromtetraethyl pholoroglucines which Hirzig and Zeisel obtained by the action of bromine upon tetraethyl phloroglucine.

These compounds are regarded by them as desmotropic to each other and having the following structural formulæ:—



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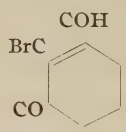
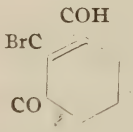
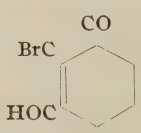


Dr. Hesse is disposed to view these substances as identical in structure, but isomeric from a stereochemical point of view as shown below:



and



in much the same manner that Skraup and Würstl assume quinine, quinidine (conchinine) and quinicine to be. That quinine, as well as cinchonidine, each contains at least one double carbon bond is shown by the occurrence of hydroquinine and hydrocinchonidine; but it remains to be determined whether the above-mentioned relations between quinine and homoquinine, as well as cinchonidine and homocinchonidine, would be satisfactorily accounted for by the assumption of a change in the situation of that bond.

ULEXINE AND CYTISINE.[1]

By A. W. Gerrard and W. H. Symons, Pharmaceutical Chemists.

Professor Kobert has drawn attention to what he considers the close resemblance between cytisine, the alkaloid of *C. Laburnum*, as described by Husemann and Marmé, and ulexine, the alkaloid of *Ulex europæus*, described by us, and he appears to think that if analyzed by the same hands these two substances would be found to be identical. Will you therefore allow us a little space to enumerate some physical differences which, if the properties assigned to cytisine are correct, alone prove them to be separate bodies, even if the chemical evidence is not considered sufficient to show them to be distinct alkaloids.

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[1] From *Phar. Jour. and Trans.*, June 14, 1890, p. 1017.

For convenience we will tabulate these differences:

CYTISINE. $C_{20}H_{27}N_3O$.	ULEXINE. $\frac{1}{2}C_{22}H_{28}N_4O_2$.
Permanent in air.	Very hygroscopic.
Sublimes completely, forming splendid crystals.	Refuses to sublime in air without decomposition, and when heated *in vacuo* does not sublime to any extent at 225° C.
Scarcely soluble in chloroform.	Freely soluble in chloroform.
Formula weight 324·41.	Formula weight × 2, 379·34.

These results, as regards ulexine, we have carefully repeated, and have made the test *in vacuo* even more severe, by enclosing the alkaloid in a vacuous tube bent twice at right angles and surrounding one limb with small fragments of ice, while the other containing the alkaloid was immersed with a thermometer in a double bath of syrupy phosphoric acid, which we find to be the best liquid for high temperature work. Only a few small crystals were formed above the heated portion of the tube. The temperature of the bath was slowly raised to about 300° C., when the alkaloid appeared to boil; it gave off bubbles of gas and a small quantity of colorless liquid distilled over. When cooled by ice and opened under mercury the tube was found to contain a considerable quantity of carbon dioxide. This, we think, proves that neither in air nor *in vacuo* can ulexine be sublimed unchanged.

That ulexine and cytisine have much in common there can be no doubt, but so they have with eserine and sparteine, both of which are alkaloids obtained from plants belonging to the same natural order, and in percentage composition they are not far removed from pyridine, nicotine and pilocarpine. The following table arranged according to the percentage of carbon is instructive:

	Carbon.	Hydrogen.	Nitrogen.	Oxygen.
*Sparteine ($C_8H_{13}N$?), . . .	78·05	10·57	11·38	—
Pyridine (C_5H_5N), ...	75·90	6·34	17·76	—
Nicotine ($C_{10}H_{14}N_2$), ...	74·08	8·64	17·28	—
*Cytisine ($C_{20}H_{27}N_3O$), . . .	73·85	8·31	12·92	4·92
*Ulexine ($C_{11}H_{14}N_2O$), . . .	69·42	7·38	14·77	8·43
*Eserine ($C_{15}H_{21}N_3O_2$), . .	65·49	7·64	15·27	11·60
Pilocarpine ($C_{11}H_{16}N_2O_2$), .	63·42	7·71	13·50	15·37

It is to be noted that when arranged in this way there is a difference of approximately 4 per cent. in carbon less, and an increase of

over 3 per cent. in oxygen, between each member of this group of alkaloids of leguminous plants. Furthermore, their physiological action, as far as we are capable of judging, seems to become more powerful as the percentage of carbon decreases; the dose of sparteine sulphate being 0·1 gram, and that of eserine sulphate 0·003 gram, and intermediate to these are cytisine and ulexine. They likewise become more unstable in the same order, thus: Sparteine may with care be distilled unchanged; cytisine may, we are told, be sublimed, yielding splendid crystals; but ulexine becomes red on continued exposure to air, and rapidly decomposes at a temperature a little above its melting point. Eserine is still more unstable, its decomposition product (rubreserine) having been examined and described, and it is entirely decomposed at 100° C.

We do not know that any special relationships exist between nicotine and the other alkaloids we have mentioned, but it is a singular fact that the formula we have given to ulexine only differs from that of nicotine by CO, and that if the formula usually ascribed to eserine be multiplied by two and that of nicotine by three the difference is O_4. The elements of water added to the formula for ulexine give us the formula for pilocarpine, and these alkaloids have a physiological likeness, although quite different in their behavior to chemical reagents.

We are at present engaged on the preparation of cytisine, and hope soon to be able to report the results of our examination of this alkaloid.

London, June, 1890.

THE TOXIC PRINCIPLE OF PYRETHRUM FLOWERS.[1]

By Messrs. Schlagdenhauffen and Reeb.

The authors having been for some time occupied in a pharmacological and chemical investigation of pyrethrum flowers from different sources have been induced by the publication of Hirschsohn's paper upon the subject (see *Pharm. Journ.*, May 3, p. 892) to make known their results, so far as they apply to the toxic principle.

A quantity of 250 grams of powdered pyrethrum flowers was distilled in a current of steam until 750 grams of aqueous distillate,

[1] *Journal der Pharmacie von Elsass-Lothringen*, June, p. 123. Reprinted from *Phar. Jour. and Trans.*, July 26.

charged with essential oil, had been collected. After filtration through a moistened filter the filtrate was shaken with ether, the ethereal solution separated, filtered and evaporated at a temperature below 30° C., until there remained in the capsule a small quantity of water and a few small green drops. The aqueous portion, separated by means of a moistened filter, had an odor of black tea, was slightly acid to litmus, but did not appear to incommode insects. The green drops were toxic, but did not contain any alkaloid.

In a second operation the distillate was treated under the same conditions with chloroform, which left upon evaporation an acid and toxic residue.

The same acid compound was also obtained under other conditions. For instance, the powder was submitted to displacement with amylic alcohol, the amylic liquor shaken with water in a separator, the aqueous layer removed, filtered and neutralized with baryta water; then heated on a water bath to drive off the amylic alcohol dissolved in the water, after which it was filtered and the baryta saturated with sulphuric acid in excess. Finally, the liquid was shaken with ether, and upon evaporation of the ethereal liquid there was obtained a greenish acid residue, partially soluble in water and giving a solution having insecticidal properties. If instead of amylic alcohol ordinary alcohol were used the same result was arrived at.

In another experiment the pyrethrum powder was moistened with alcohol containing a little acid, then dried and afterwards exhausted with ether. The ethereal solution was treated with ammonia water, and the latter separated, filtered and evaporated to dryness. The residue was redissolved in water, and after filtration it contained in solution the ammoniacal salt of the toxic acid of pyrethrum powder. The solution was toxic to insects, and gave with silver nitrate, neutral lead acetate, or neutral lead acetate in alcoholic solution an abundant precipitate; with barium nitrate, calcium sulphate or ferric chloride no precipitate.

In another operation 200 grams of powdered pyrethrum flowers was displaced with a litre of chloroform. The solvent was recovered by distillation, and the residue was worked up with water to free it from an inactive substance. The extract was afterwards taken up with 90° alcohol, and the alcoholic liquid filtered and

evaporated. The residue treated with water and ether under suitable conditions yielded the toxic acid as an amorphous and hygroscopic mass. In order to obtain the inactive acid in a pure state the impure acid was taken up with water, and the solution allowed to stand twenty-four hours; then it was shaken with ether to remove a resinous matter, filtered and evaporated. The residue again taken up with water and the solution filtered and evaporated gave the acid in a pure condition.

The acid nature of the active principle having been thus established, it was sought to isolate it by converting it into a lead salt, and for this purpose an alcoholic solution of it was precipitated successively with neutral lead acetate and triplumbic acetate. The two precipitates, well washed, were suspended in alcohol and treated separately with sulphuretted hydrogen; after filtration the solutions were saturated with caustic potash, evaporated to dryness, redissolved in acidulated water and the solutions shaken with ether. In this way were obtained a non-toxic acid, corresponding to the precipitate thrown down by the neutral acetate, and another acid, corresponding to the precipitate by the tribasic acid, which inconvenienced insects only, without killing them. The toxic principle appeared to have escaped during this mode of operating.

Another method was therefore tried, consisting in treating the chloroformic extract first with water to remove the inactive extract, then with five successive quantities of dilute alcohol, increasing in alcoholic strength from one part in ten to five in ten. These alcoholic solutions contained the whole of the toxic principle. They were mixed together, neutralized exactly with caustic potash solution and evaporated carefully to dryness. The residue was taken up with water and the solution filtered, which took some time. The clear liquor was then shaken with a solution of tartaric acid in a separating funnel, and then with ether. The supernatant layer, filtered and evaporated, left an acid and poisonous greenish residue of "pyrethrotoxic acid." The lower layer, which had already been shaken with ether, was again treated with chloroform, which also took up a certain quantity of the toxic principle.

En résumé, the active principle of pyrethrum flowers is an acid soluble in alcohol, amylic alcohol, ether and chloroform, which may be isolated by means of ether after having been converted into an alkaline salt and decomposed by tartaric acid in aqueous solution.

When pyrethrotoxic acid was hypodermically injected into animals, it was observed that the poison produced its effects in two distinct stages. In the first there was an excitement more or less pronounced, proportional to the quantity administered; in the second there was a complete prostration, accompanied always by paralysis of the lower extremities, which might disappear after a time, or be the precursor of a fatal issue, the respiration and circulation being affected only in the latter case.

ON CEDAR GUM (CEDRELA AUSTRALIS, F.v.M).[1]

By J. H. Maiden, F.L.S., F.C.S.

The well-known "Cedar" or "Red Cedar," of New South Wales and Queensland, is the produce of a *Cedrela*, but in regard to the species there is a difference of opinion. Bentham (B.Fl., i, 387) considers it to be identical with *C. Toona*, Roxb., the Indian toon tree, which produces "Moulmein Cedar" and one of the "Chittagong woods." Baron von Mueller, on the other hand, created a new species for it (*C. australis*, F.v.M.) It is very certain the affinities of the two trees are very close, and it becomes interesting to see if examination of any of their products tends to throw any light on the subject.

The writer is not aware that the finding of gum on the New South Wales cedar has hitherto been recorded, but a collector sent to the Technological Museum a small quantity recently. An old cedar-getter says that trees well exposed to the sun (? in unsuitable situations) yield most gum.

It is a very pale yellow gum, almost colorless, and in thin tears about an inch long. Between the teeth it almost feels leathery. It swells up largely in cold water, but in the course of twenty-four hours it nearly wholly dissolves, forming a solution colorless and faintly cloudy, like good gum arabic, and leaving a small percentage of metarabin.

It is one of the gums which form a connecting link between the arabin group—those gums which dissolve almost immediately in water, and the metarabin group—those which merely swell up in that liquid. It forms a fair mucilage, and on account of its freedom

[1] From vol. iv. (series 2d), of the *Proceedings of the Linnean Society of New South Wales*. Reprinted from *Phar. Jour. and Trans.*, June 28, 1890, p. 1063.

from color it would be a valuable commodity if obtainable in any quantity. An analysis gave the following result:

Arabin,	68·3
Metarabin,	6·3
Hygroscopic moisture,	19·54
Ash,	5·16

Here we have a true gum, without so much as a trace of resin.

Following is the evidence the author has been able to collect in regard to the exudation of the Indian tree.

"It yields a *resinous* gum" (Cat. Kew Museums). Perhaps the experiments of von Esenbeck (*infra*) are the foundation for this statement.

"It is called bastard cedar from an aromatic (*sic*) *resin* exuding from it, resembling that of the American cedar" (Art. *Cedrela Toona* in Surgeon-General Balfour's 'Cyclop. of India'). No definite authority is given for this statement, and the writer is probably laboring under a misapprehension, as the name cedar was bestowed in reference to the wood, and not to any exudation.

The experiments of Nees von Esenbeck, who *extracted from the bark a resinous* astringent matter, and a brown astringent *gum*, do not affect the point at issue one way or the other.

"Toon-ke-gond" (*C. Toona*) is enumerated by Dr. Wight as one of the *gums* of Coimbatore. Yet Cooke ('Gums and Resins of India'), who quotes this statement, says, "From the character of the timber one might suppose it rather a resin than a gum." I am not impressed with the force of the latter observation.

A sample of "Toon-ke-gond," the exudation of *C. Toona*, was exhibited by Dr. Royle at the exhibition of 1851 (No. 52, p. 180, Jury reports). It is not definitely stated whether it is a gum or a resin, and there is nothing in the context to clear up the point absolutely.

Dragendorff ('Pflanzenanalyse,' Greenish's Trans., p. 212) speaks of "the partially soluble *gum* of species of * * * *Cedrela*." To this specific statement of a man who only employs the term "gum" in its proper significance, I attach much importance.

I consider the balance of probability to be largely in favor of the exudation from the Indian species being a gum and not a resin. As collateral evidence, the exudations from the Indian *Melia Azadirachta*, Linn. (another of the "Chittagong woods"), and the Australian

form of *M. Azedarach*, Linn., may be instanced together with the spotted or leopard-tree gum (*Flindersia maculosa*). These are the only other exudations of the *Meliaceæ* recorded as far as I know. I have seen and examined them and they are true *gums*.

ASSAY OF GUM ARABIC AND GUM SENEGAL.[1]

By Liebermann.

(1) Gum arabic forms round or angular, colorless, yellowish or brownish lumps, which strongly refract the light, and look as if they possessed a crystalline structure. Owing to the disturbed state of trade in the Soudan, much of the gum arabic nowadays imported is partly, or even totally, composed of gum senegal.

(2) Gum senegal forms either colorless or yellowish lumps, somewhat whitish on the surface (resembling corroded glass), the interior of which is, however, clear and lustrous. The lumps are generally longish, straight or bent, vermicular or cylindric. Sometimes they look as if small lumps have deposited round a larger one. They have to a certain extent the shape of mulberries. If, therefore, the sample is not in powder or too small lumps the very appearance will tell the fraud.

(3) Both varieties are completely soluble in water; there only remains small particles of wood, which, in samples of gum arabic, are generally reddish, but blackish in the gum senegal. These woody particles are found even in the superior kinds of the gum. Other gums, like cherry gum, are only partly soluble in water. There remains a jelly which only dissolves on prolonged boiling.

(4) The watery solution of both gums gives with potash-lye and a few drops of solution of copper sulphate bluish precipitates; but with gum arabic the precipitate is more abundant, sticks together, and rises to the surface of the fluid. The precipitates are not dissolved on heating and do not reduce the copper.

(5) Dextrin solution also gives a blue precipitate, but this dissolves completely on warming to a clear dark-blue fluid. On prolonged boiling the copper gets completely reduced.

(6) Heated for a long time with dilute potash, gum arabic or dextrin turn amber-yellow, whilst gum senegal scarcely colors at all.

[1] *Chem. Zeit.*, No. 41, 1890. Reprinted from *The Analyst*, August, 1890.

(7) Mixtures of the two gums behave towards potash and copper sulphate like pure gum senegal, but on boiling with potash alone the mixture turns amber-yellow.

(8) Mixtures of gum arabic and dextrin behave towards potash and copper sulphate like pure gum, but on long boiling reduction takes place if at least the amount of dextrin is not too small.

(9) To detect *small* quantities of dextrin the liquid must, after a slight warming, be filtered before boiling.

(10) In similar manner the separation must be performed when both kinds of gum are present, as well as dextrin. The cupric precipitate containing both gums is washed with distilled water, dissolved in a little dilute hydrochloric acid, and mixed with a large excess of spirit. After standing for a day, the transparent deposit is dried, then dissolved in hot water, and tested according to 4 and 6.

The assay of gum arabic may also be prepared according to the following scheme:

(*A*) The appearance of the sample when not in powder. (See 1 and 2.)

(*B*) Try the solubility of the powdered sample in warm water. (See 3.) If the sample is but partially soluble, and leaves a jelly-like mass, there is no doubt cherry gum. If practically soluble, the solution is mixed with excess of potash and a little copper sulphate, gently heated and filtered:

(*a*) The filtrate is treated for dextrin according to 9.

(*b*) Precipitate is treated as described in 10. The deposit will either agglomerate and float, or remain suspended in the fluid. In the first case there is gum arabic, and the original fluid will turn amber-yellow with potash. In the second case if there is no color got with potash, there is only gum senegal.

It has been said gum senegal is more hygroscopic than gum arabic. To make sure the author dried both specimens at 105° C., and then exposed them for twenty-four hours to moist air, when gum arabic was found to be even a trifle more hygroscopical than the gum senegal.

Camphoric Acid was found by Dr. Leu (*Wiener Medic. Blätter*) to give better results than atropine in cases of night-sweats due to phthisis. The average dose was 2 gm., given about noon, and 2 to 3 gm., given at night. In some cases, 4 or 5 gm. were given, usually in capsules, though the taste is not unpleasant. The after-effects are quite insignificant.

OTTO OF ROSE CULTIVATION IN TURKEY.[1]

Writing from Constantinople, under date of May 21, Mr. Herm. A. Holstein says that according to the last reports from his branch house in Kissanlik, the condition of the rose fields was not exactly an unfavorable one. However, a drought had been prevailing for the last few weeks, and just before the beginning of the distillation of the roses, rain would be most desirable. Should the drought continue for a fortnight more, a heavy deficiency in the result of the crop will be experienced. Continuing, Mr. Holstein says:

An accurate estimate can only be arrived at later on. Owing to enlarged cultivation of rose bushes during the last decade, the production of otto of rose has been largely increased, but as the nature of the soil, sufficient water supply and the climatic location of the rose fields influence greatly the quality of the oil, the value of same, according to the location of the producing places, has been greatly changed. Generally the oil distilled from roses growing on the high slopes on the south side of the Balkans is more highly congealable than that of roses grown in the plains. The market price in Kissanlik as a rule is fixed on the basis of the congelation point, the higher congealable oils fetching highest prices; even too high in proportion to oils of lower degrees. By far the larger portion of the total production congeals within 13½° to 15° Réaumur, while of oil congealing under 13° and above 16° Réaumur, only a limited quantity is produced. The assertion made in some quarters that an actually pure otto of rose congeals only from 14° to 16° Réaumur, and that oil congealing below 12° Réaumur must be adulterated is absolutely incorrect. If it were true, under what category would those oils that congeal from 14° down to 12° Réaumur, and which form a large proportion of the total crop, have to be placed. It is a matter of fact that some villages produce a very fine pure oil that does not congeal above 13° to 13½° Réaumur, and that in other villages just as fine an oil is produced that congeals at a lower degree only. Again, it is a fact that other villages produce an oil congealing at 14–14½° R., but in consequence of inferior perfume it is worth considerably less than oil of lower degree. There are also several villages producing oil varying greatly in regard to congelation; among others I mention Diliri

[1] From the *Oil, Paint and Drug Reporter*, July 2, 1890.

and Dabini County of Karlowa, Eoschilir County of Tcherpan, Ididjali County of Kissanlik, all distilling oils congealing within 12–15° Réaumur, so that in one and the same village producing perfectly pure oils, the point of congelation sometimes differs 3° R. The more or less care taken in the distillation and the mode of distilling are very important factors. Two different sorts of roses are cultivated for distillation of otto of rose, viz: the red rose (Rosa damascena) and the white rose (Rosa alba). The latter, however, is cultivated less than the former. The Rosa alba renders a very high congealable oil, but as to perfume a much inferior quality oil, and this quality is mostly bought at lower prices by those merchants and speculators who put high congelation degree above all other considerations, to make capital out of it. By the foregoing is shown that the purity of otto of rose cannot be based on the congelation degree alone, but that the fineness of the perfume is a much more important factor.

Adulteration of otto of rose at the places of production is not unusual, but is done more by merchants and speculators than by the oil-producing peasants. I don't speak of adulteration with spermaceti or alcohol, which can easily be detected. The usual adulteration, which is difficult to detect, is done with oil geranium and although the Bulgarian Government has prohibited the import of these oils, and many seizures are made on the frontier, some oil reaches its destination safely through smugglers. In selecting the different oils, long years of experience and a thorough knowledge of the article is required, and it is advisable for dealers and consumers of otto of roses to place their orders in the hands of firms who for years have gained the confidence of the trade and whose brands have a reputation in the principal markets.

The best time to purchase otto of rose is at the beginning of the campaign, about one month after the end of distillation, as at that time, better than at any other date, the finest oil can be secured; until the prices for otto of rose are established, by an understanding between the producers, about one month generally elapses. As to keeping oil of rose for a long time in copper cans I wish to say that it is not advisable to do so. The cans are tinned inside, and no matter how much care is taken in this tinning process, some small particles may come off, darken the oil, make it cloudy and spoil the fine perfume.

CALIFORNIA RAISINS.[1]

There is one vast fruit industry of which California has and is likely to hold a practical monopoly. That is the production of raisins. Vineyards elsewhere may compete with those of California in wine making, but nowhere else are there combinations of soil and climate so favorable to raisin-making as here. This fact was discovered a long time ago. Dried grapes of various kinds were prepared in the old missions long before California became a part of the United States. And fully 30 years ago the manufacture of raisins, for home consumption chiefly, was systematically carried on, and on a considerable scale. But it was not until five years ago that the State began fully to realize its capabilities in that direction. In 1885, there were almost as many raisins produced as in all the 20 years preceding put together. Since then increase has been phenomenal, amounting to about 250 per cent. in four years. There has been, however, no overproduction and no reaction. A ready and profitable market has been found for all the output, and every one who has gone into the business has been more than satisfied with the results. Next year there will be a greatly increased acreage, and the output of raisins will be enormous.

The Spaniards and Indians used to dry the Mission grapes. That was about the only kind of grape grown here down to 1860, and the first experiments in genuine raisin-making were made with it. That they were not highly successful was due simply to the fact that nature did not design the Mission grape to be turned into raisins. But the men who made the experiments were not discouraged. They were convinced that California might easily be made the greatest vineyard in the world. But to accomplish that end it would be necessary to introduce some other varieties of grapes. So they sent to Europe and brought over shiploads of cuttings from the vineyards of France, Spain, Italy, Germany and Hungary. These were scattered all over the State, and from them have sprung the vast vineyards of the present day. The chief object aimed at then was the production of wine, and the cuttings were selected accordingly. But among the varieties imported were three of the best raisin grapes in the world—the *Feher Zagos*, the *Muscatel* and the

[1] From a correspondence dated Los Angeles, July 28, 1890, published in *The New York Tribune.*

Muscat of Alexandria. From these, and especially from the second, much wine is made. But they supply also the raw material for the millions of boxes of raisins that are each year shipped from California to the markets of the world.

Where, when and by whom raisins were first successfully made for market is not well established, but it was probably in 1863, and the grapes used were Feher Zagos and Muscat. For some years thereafter, however, little interest was taken in the subject. A few raisins were made, experimentally, out of curiosity, or to supply a small local demand. That was all. Not until 1873 was the work taken up in thorough earnest. But in that year it was entered into extensively in several parts of the State at the same time and the result was the production of 6,000 boxes, or 120,000 pounds, of pretty good raisins. There was much to discourage the growers, however. They were trying to make raisins according to the methods practised in Spain and elsewhere in the Old World. But these methods would not work well here. Nor, indeed, were American manufacturers willing to follow out the full formula of Spain, which involved some utterly disgusting details. And as yet they had discovered no new system of their own. For several years there was much work and no profit. Sometimes a man would turn out as good raisins as ever were seen. Then he would make a lot that were too moist, and they would mould and rot; while a third attempt would result in dry, shrivelled things that rattled about in the boxes like so many hickory nuts. Many men grew quite discouraged, and either rooted up their vineyards altogether or took to making wine. But there were some who stubbornly persevered in trying to make raisins.

Their labors were at last rewarded by the discovery that the best formula was no formula at all. That is, that raisins were to be made best by the simplest possible process, without any dipping into strange mixtures, or spreading on gravel beds, or any such work. The fruit must be just at the proper point of ripeness, and the less it is handled the better. The bunches are laid on wooden trays, about 20 pounds to the tray, and thus exposed to the sunlight and sun heat for several days. Six to eight days generally suffice, but considerable skill is required to determine when exactly the proper stage of drying has been reached. Then they go into what are called the sweat-boxes for a week or so, where the moisture that

remains in them is equally distributed throughout the whole berry. Then they are sorted and packed, the whole bunches being packed in that form, while the broken clusters have all the stems removed and are packed as stemless raisins. The stemming is done by machinery, but the packing is done by hand, women and girls being employed for the purpose.

The three grapes mentioned form the mainstay of the raisin industry. In some places the seedless Sultana does well, and it is believed by many that it will soon become the favorite raisin grape. In the southern part of the State the Malaga grape succeeds better than any other, but at the present time the Muscat is grown probably more than all others put together. It has a rich and spicy flavor that no other raisin grape possesses, and on this account Muscat raisins are most in demand. It grows well in almost any soil, and is the most steady and trustworthy of all in its bearing. The vines are usually planted five feet apart, in rows 14 feet apart. Artificial irrigation has, of course, to be employed. The returns from a vineyard come very quickly. The second year a fair crop may be gathered from rooted vines, and the third year from cuttings. A year or two later the vineyard is in full bearing. There are cases on record of more than $50 worth of grapes being taken from an acre of vines that had been in the ground only a year and a half. Good raisin land can be purchased in the various localities adapted to the industry at from $50 to $200 per acre. The location governs the price, and the $50 land will be just as good as the $200, except that it will be more remote from shipping facilities. It is calculated, from the experience of hundreds of growers, that an expenditure of $60 an acre will cover the entire cost of planting and cultivating for three years. If the raisin grower does his work himself this expense will be reduced solely to the outlay required for the vines and possibly a little help in planting.

In the early days of raisin production it was customary for the growers to pack their own fruit and market it themselves. There was a great deal of loss from this system, caused by the irregularity of grading and the difficulty of finding a market for the fugitive shipments thus made. Subsequently there grew up a system of wholesale packing, by which firms established themselves in the raisin districts, put up large warehouses and then contracted for the fruit in the sweat-boxes. The producer received cash on delivery,

while the packer assorted and graded all the fruit received, and so was able to establish uniform brands. The price for the raisins in the sweat-box has varied considerably. It has been as low as four cents a pound, but with the increase in production and the widening of the market there has been a steady stiffening in prices, and last year from five to six cents was paid.

The greatest raisin county in the State is Fresno, where the soil is peculiarly adapted to grape culture. That county last year produced about 625,000 boxes of raisins of the best quality. Riverside came next, with 225,000 boxes. Twenty years ago there were less than 1,500 grape vines in all San Diego County. Now there are 3,000,000. Yolo was the scene of some of the earliest raisin making, and its output last year was 130,000 boxes. The most carefully prepared statistics show the entire raisin product of the State to have been in various years as follows: 1875, 222,000 pounds; 1880, 1,500,000 pounds; 1885, 9,500,000 pounds; and in 1889, 32,678,000 pounds. What the yield of the present year will be cannot be estimated as yet with any accuracy, but it will probably reach 45,000,000 pounds, for the increase in acreage is very great. Last year there were less than 60,000 acres of vines in bearing, but planting was carried on extensively. Perhaps 10,000 acres of new vineyards are in bearing this year, and next year nearly 95,000 acres will be in full bearing. This should swell the output of raisins in 1891 to at least 55,000,000 pounds.

LIQUID KINO.[1]

By J. H. Maiden, F.L.S., F.C.S., Curator of the Technological Museum, Sydney.

Angophora intermedia (D.C.), the narrow-leaved apple tree, is a tallish tree, which extends from Victoria to Queensland, and is the only species of the genus which is found in the southern colony. In the following respect it is perhaps unique amongst Australian trees. Frequently, when an incision is made into the bark, and more particularly when the knobby excrescences sometimes found on this tree are cut, there exudes a watery liquid, which occasionally is almost as clear and as colorless as water, and at other times

[1] Read before the Royal Society of Victoria, July 11, 1889. Communicated by Baron Ferdinand von Mueller, K.C.M.G., F.R.S., etc. Reprinted from *Phar. Jour. and Trans.*, July 12.

of an orange-brown or reddish-brown color, and of the consistency of a thin extract, or even as thick as treacle. This is doubtless the substance which was sent from New South Wales to the Paris Exhibition of 1867, labelled "apple-tree juice," with the statement that it is used as a varnish; but this is not correct, as the liquid is aqueous. It is used by fishermen for tanning their nets. Mr. Kirton informed Baron von Mueller that a single tree will yield as much as 2 gallons of liquid, which is generally called "liquid kino." This is a modest computation, for the tree which yielded the Bangley Creek sample (*infra*) yielded from 8 to 10 gallons. The quantity is, in any case, by no means small, and is dependent on a variety of circumstances.

Two samples of this "liquid kino" having recently been forwarded to the Technological Museum, the author has had an opportunity of examining it.

(1) From Bangley Creek, Cambewarra, N.S.W., of a clear reddish-brown color, and in order to give precision to the tint, it is very like raw linseed oil, Strassburg turpentine, or dark balsam of copaiba, but redder than any of them. It has a specific gravity of 1·008 at 60° F., and an acidulous smell (owing to the presence of acetic acid), accompanied by an odor not so pleasant and reminding one somewhat of spent tan liquors. It deposits a quantity of sediment of a buff color, consisting almost entirely of catechin. It contains tannic acid ·772 per cent., "non-tannin" ·508 per cent. (Löwenthal's process). The water amounts to no less than 98·3 per cent. The catechin was not estimated in this sample.

(2) This was obtained from Cambewarra, but from a different locality. It is darker in color than the preceding sample, being of a richer ruby color. Like No. 1, it deposits a small quantity of sediment (catechin). This liquid kino had a specific gravity of 1·022 at 60° F., when received in April, 1888.

The following results were obtained in December to January, 1889:—Tannic acid 3·048 per cent. (of the liquid kino, without evaporating), "non-tannin" 1·27 per cent. (a portion of liquid kino, kept in agitation so as to obtain a fair proportion of sediments, was added to water to make up the strength of one grain of liquid kino to the litre), water 96·7 per cent. (after filtration from deposited catechin). The catechin and a little phlobaphene filtered off, were found to be in the proportion of ·495 per cent. of the original liquid

kino. Ether agitated with the filtrate took up ·15 per cent. of which one-third was estimated to be catechin, and the rest resin.

Mr. Kirton has recorded liquid kino from the Illawarra district of New South Wales, but since there appears to be no reason why it should be found in one colony more than another, it will doubtless also be obtainable in Victoria, most likely on application to fishermen.

ON BOILED LINSEED OIL.

By Frank H. Thorp, S.B.

The author has published in the *Scientific American* the details of a large number of experiments on the preparation of boiled linseed oil with the agency of the oxides and various salts of lead, zinc and manganese, and his results are summarized in the following:

CONCLUSIONS.

Lead driers always give the oil a deep color, which shows more or less in the film.

Zinc driers do not appear to act on the oil to any great degree, as oils thus prepared dry slowly and do not give very hard films.

Manganese driers give the best results in all respects. Litharge gives the best results of the lead driers, the oil being quick drying and the film hard, and, if not overheated, the oil is but moderately colored. Of the zinc salts, the acetate seemed to give the best results, although the borate and citrate were nearly as good. The borate and acetate of manganese gave the best results obtained. The acetate requires careful use, for, if heated much above 230°, it gives a deep color to the oil, owing apparently to the formation of tar. The borate undoubtedly gives the best boiled oil for all purposes.

The oxalate is difficult to decompose, or at least has little or no action on the oil until a very high temperature is reached. In two experiments the quantities of borate and oxalate used and the temperature of each were nearly the same, but the borate gave a good oil, while the oxalate did not.

The chloride, nitrates and sulphates do not make good driers. The first two have too violent an action on the oil, while the last are very difficult to decompose, requiring a high temperature.

There appears to be no advantage in the use of formates, citrates,

or tartrates. The first two are apt to produce much tar, and the last are difficult to decompose.

No very definite conclusions can be drawn as to the relation between the quantity of drier dissolved and the rate of drying of the oil. From the few analyses made there would appear to be some relation here: but in two cases, lead borate and manganese tartrate, exceptions were found. The lead borate gave an oil drying much more slowly than was to be expected, while the manganese tartrate oil dried with comparative rapidity. The quantity of manganese dissolved appears to be much less than the quantity of lead taken from lead dryers. Two-tenths of one per cent. of manganese appears to give a good drying while about one per cent. of lead occurs in the best drying oils.

THE MEDICINAL USES OF LEAVES.

By P. L. Simmonds, F.L.S.

In continuation of the previous article on the reputed medicinal uses of leaves, published in the April number, pages 193 to 197, I now append a supplementary list:

The leaves of *Abrus precatorius*, when mixed with honey, are applied to swellings, and in Jamaica are used as a tea substitute. In Africa they are chewed by singers to moisten the throat. A curious use is also made of them as a sort of love philter, recognized by fetiches. They are given by suitors or lovers, steeped in spirit, to a father, to induce him to give his daughter in marriage.

The dried leaves of *Adhatoda vasica*, made into cigarettes, are smoked in cases of asthma, and produce very beneficial effects.

The dried leaves of *Abies Webbiana*, known as Talispatra in India, are regarded as carminative, expectorant, stomachic, tonic and astringent; useful in phthisis, asthma, bronchitis and catarrh of the bladder. The dried leaves of various plants also receive the name of talispatra, provided they are found useful in the treatment of coughs (Watts).

An essential oil is obtained from the leaves of *Acorus Calamus*, which is used in England by perfumers in the manufacture of hair powder. Formerly the leaves of the sweet flag were spread over the floors of churches and cathedrals (especially in Norfolk) upon great occasions, the pressure of the foot causing a pleasant odor.

The leaves of *Achyrantes aspera*, reduced to a pulp, are considered a good remedy, when applied externally to the bites of scorpions.

The leaves of *Ægle Marmelos* are made into poultices and used in the treatment of ophthalmia. A decoction of the leaves is used as a febrifuge and expectorant.

The leaves of *Albizzia Lebbek* are regarded as useful in ophthalmia. Those of *A. odoratissima*, boiled in ghee (or fluid butter), are used by the Santals as a remedy for coughs.

The leaves of *Allamanda cathartica* are considered a valuable cathartic in moderate doses.

The acrid leaves of some aromatic species of *Ammania* are universally used in India to raise blisters in rheumatic pains, fevers, etc., which they do in half an hour.

The leaves of *Asarum europæum* have been strongly recommended in headache, chronic ophthalmia, rheumatic and paralytic affections of the face, mouth and throat, and are in great repute in Russia as a remedy for deranged state of health, consequent on habits of intoxication.

The juice of the leaves of *Ballota lanata* is applied to children's gums, and in ophthalmia in man and beast.

Buchu leaves (*Barosma spec.*, see p. 194), when used in the form of infusion, promote perspiration. Hence their utility in chronic rheumatism, gout and other diseases, caused by the sudden suppression of cutaneous action. They have been prescribed also in cholera morbus, and are very beneficial in diseases of the bladder. They have also been given in dropsy. As a stimulant to the stomach some practitioners have used the buchu leaves in indigestion. A bath of the buchu leaves is of service in rheumatism, and the buchu vinegar and buchu brandy are excellent embrocations in rheumatic pains, sprains and contusions.

The natives of India apply the juice of the leaves of *Barleria prionitis* to their feet in the rainy season to harden them, and thus prevent the laceration and cracking of the soles which would otherwise occur.

In India an extract or juice obtained from the leaves of *Barringtonia acutangula*, mixed with oil, is used in native practice for eruptions of the skin.

The astringent leaves of *Brasenia peltata* have been employed in phthisis and dysentery in North America.

The leaves of *Cardiospermum Halicacabum* are used in amenorrhœa and administered in pulmonic complaints. A paste made with the leaves, rubbed up with castor, is applied in rheumatism, and to reduce swellings and tumors of various kinds.

The young tender leaves of *Cæsalpinia Bonducella* are considered very efficacious in disorders of the liver, and are used in intermittent fevers and for expelling intestinal worms.

The fresh juice of the leaves of *Clerodendron infortunatum* is employed by the natives of India as a vermifuge and also as a bitter tonic and febrifuge in malarious fevers, especially in those of children.

The leaves of *Cassytha filiformis* are used as an aperient, and a decoction constitutes a valuable wash in skin diseases.

The leaves of *Cerbera Odollam* are used in Java as a substitute for senna, but their use is dangerous.

Chenopodium ambrosioides has a strong aromatic smell from the ethereal oil it contains. Its properties are antispasmodic, diaphoretic and anthelmintic, and the best form for its administration is that of tea or infusion.

The leaves of *Cymbonotus Lawsonianus* are made into a salve with melted lard in New South Wales, which is much appreciated for its healing qualities for wounds, etc.

The leaves of *Duboisia Hopwoodii* (Mueller), known as *Pituri*, form the masticatory of the aboriginals of Central Australia, corresponding in this

respect to the coca of Peru, the betel nut of Asia and the kaat (*Catha edulis*) of Arabia.

The leaves of *Eucalyptus globulus* and other species possess febrifugal properties to some extent, and extracts and liquors are sold as fever and ague remedies and as a general tonic. An extract of Eucalyptus leaves is said to remove scale from boilers. *E. maculata* has a delightful odor of citron, and is used to perfume and protect clothes. The leaves of *E. Staigeriana*, of Queensland, possess an odor very like the scented verbena, *Lippia citriodora*. The yield of oil obtained from them is from 2¾ to 3 per cent.

The leaves and flowers of *Galium africanum* are said to be a cure for diarrhœa.

The fragrant leaves of *Panax Lessonii* bruised and mixed with grease form a favorite native perfume in New Zealand.

The sap of the crushed leaves of *Hydrocotyle asiatica* is used with alum in the Cape Colony for sore mouths. It is recommended in India as a remedy for leprosy.

The leaves of *Helichrysum pedunculare* are used as a healing plaster on the white side, and as a drawing plaster on the green side.

The boiled leaves of *Ipomœa Pes-capræ* are used internally as an anodyne in cases of colic, and in decoction in rheumatism.

An infusion of the leaves *Lantana salviæflora* is said to cure infectious ophthalmia, but it produces burning pain and is, therefore, somewhat dangerous.

The wild hemp, *Leonotis Leonurus*, is employed in the form of a decoction in chronic cutaneous eruptions, and may be tried even in cases of leprosy. The usual dose is a wineglass full three or four times a day. The Hottentots are particularly fond of this plant, smoke it instead of tobacco, and take a decoction of its leaves as a strong purgative.

The leaves of *Melaleuca uncinata*, if chewed, are very useful in alleviating and curing ordinary catarrh.

The leaves of *Melastoma malabathricum* are used in India in cases of diarrhœa and dysentery.

The expressed juice of the succulent leaves of *Mesembryanthemum edule*, taken internally, checks dysentery, and acts as a mild diuretic; while it is also, for its antiseptic property, used as an excellent gargle in malignant sore throat, violent salivation and apthæ, or in the form of a lotion in burns and scalds.

In the Cape Colony the dry leaves of *Mohria thurifraga* are pulverized and with fat made into an ointment, which is cooling and very serviceable in burns and scalds.

In India the leaves of *Morinda citrifolia* are used as a healing application to wounds and ulcers, and are administered internally, as a tonic and febrifuge.

A decoction of the leaves of *Melianthus major* has been found an excellent remedy in the Cape Colony for *tinea capitis*, and when applied to foul ulcers promotes granulation.

The oil of the leaves of *Pagetia medicinalis* is said to be of medicinal value.

The leaves of *Polanisia viscosa*, boiled in ghee, are in India applied to recent wounds, and the juice to ulcers.

A poultice of the leaves of *Pongamia glabra* is also a popular application in India to foul ulcers.

The leaves of *Pelargonium ramosissium* are used in amenorrhœa and dysmenorrhœa.

The leaves and flowers of *Pteronia spec.* are used in the Cape Colony as a febrifuge and also as a purgative.

The juice of the leaves and stems of *Ranunculus pinnatus* is used by the Kaffirs for wounds and sores of all kinds.

The leaves of *Anchusa riparia* (?) pounded are also used as a salve for sores and wounds.

The leaves of *Solanum niveum* are smooth on the upper and woolly on the lower surface. The application of the latter to foul ulcers cleanses them, and a cure is afterwards effected by applying the upper surface.

Like those of the common sage the leaves of the Hottentot sage (*Salvia africana*), are fragrant, astringent and bitter. They possess nearly the same medical properties as the European sage, and are used in the same way, and under similar circumstances.

Teucrium africanum is the chief plant relied on by the Kaffirs as an antidote to snake bites. An infusion of the leaves is employed, if they can be had fresh, otherwise a tincture.

PHARMACEUTICAL ASSOCIATIONS.

The Arkansas Association of Pharmacists met at its eighth annual meeting at Pine Bluff, June 24. An address of welcome by Gen. H. K. White, the annual address by President Kerr, reports by the Secretary, Treasurer and several committees, and the consideration of a revision of the by-laws occupied most of the time of the Association. A paper on *Chinese Medicine and Pharmacy* was read by E. T. Mitchell. The executive officers of the present year are W. W. Kerr, Batesville, President; J. W. Beidelman, Little Rock, Secretary, and D. W. Holman, Little Rock, Treasurer.

The Illinois Pharmaceutical Association convened its eleventh annual meeting at Kankakee, August 12, President H. Schroeder in the Chair, who in his annual address made a number of suggestions looking towards greater efficiency in the work done by the Association. The Treasurer reported a balance of $314 on hand. Reports were received from the Secretary and the several standing and special committees, and were duly acted on. An invitation for the appointment of delegates to a convention of Western pharmacists, was complied with, and ten delegates were ordered to be appointed. The meeting is to be held next year at Excelsior Springs, Mo., and is intended for the consideration of pharmaceutical interests, and to accomplish, if possible, uniformity of the pharmacy laws in the states contiguous to the lower Missouri River.

A paper on *50 per cent. Tinctures*, by A. A. Culver, elicited much discussion leading to the adoption of a recommendation, that such tinctures be introduced into the Pharmacopœia in all cases where new liquid preparations of drugs are required.

Papers were also read on *Synthetic Phenol*, by C. L. Feldkamp; on *Pepsin*, by Prof. Oldberg; on the *Use of the Microscope in Pharmacy*, by A. E. Hiss, on *Stock and Fixtures*, by C. S. Hallberg, etc.

On motion of Mr. Hallberg the International Pharmaceutical Congress was invited to hold the next meeting in Chicago in 1893.

The proceedings for the year 1889 were directed to be published with those of 1890 in conjunction with the report of the State Pharmacy Board.

Riverview, Kankakee, was selected as the place for holding the next annual meeting, on the second Tuesday of August, 1891. The executive officers for the current year are: A. A. Culver, Momence, President; C. S. Hallberg, Chicago, Secretary, and A. L. Moody, Lockport, Treasurer.

The Maine Pharmaceutical Association has been dormant for a number of years, but through the efforts of the Kennebec Valley Druggists' Association an effort at reorganization has been made last July on Long Island, near Portland, when Charles K. Partridge, Augusta, was elected President; H. E. Bowditch, Augusta, Secretary; F. R. Buck, Skowhegan, Treasurer, and H. T. Cummings, Portland, Corresponding Secretary.

The Wisconsin Pharmaceutical Association held its eleventh annual meeting at Appleton, August 12, President Edwards in the Chair. The President's address and the reports of the Secretary, Treasurer, committees and of the Pharmacy Board were received and disposed of. Among the papers read was one on *Commercial Seidlitz Powders*, by A. Conrath; on *Pill Excipients*, by F. M. Crow; on *Pharmacopœial Syrups*, by A. Conrath; on the *Apothecary Weights of Commerce*, by F. Esau, etc. A paper by J. A. Dadd, on *Sunday Closing*, gave rise to much discussion, which resulted in the adoption of a resolution favoring the partial closing of pharmacies on Sundays.

Dr. F. Hoffmann, of New York, was elected honorary member, and the following officers were chosen for the current year: R. Sauerhering, Mayville, President; E. B. Heimstreet, Janesville, Secretary, and W. P. Clarke, Milton, Treasurer. The next meeting will be held in Milwaukee, August 11, 1891. John Kienth is the Local Secretary.

The following printed proceedings of State Pharmaceutical Associations have been received:

Missouri.—Twelfth Annual Meeting. Pp. 174. See July number, p. 374. The following papers, not previously noted, were read: *Liquor Ferri Chloridi*, by F. Hemm; *Resina Podophylli*, by G. H. C. Klie; *Tablet Triturates*, by the same author; *Lycopodium*, by Dr. H. M. Whelpley; *Objections to Pepsin in Liquid Form*, by D. L. Haigh, etc.

Nebraska.—Ninth Annual Meeting. Pp. 93. See July number, p. 375.

Pennsylvania.—Thirteenth annual meeeting. Pp. 140. See July number, p. 376.

Texas.—Eleventh Annual Meeting. Pp. 89. See July number, p. 376.

EDITORIALS.

The Registration of Physicians as Pharmacists in Pennsylvania has been before the Court of Quarter Sessions of Dauphin County during the past June term. Dr. W. H. Prowell, carrying on the drug business without being registered, was prosecuted by the Pharmaceutical Examining Board and was found guilty upon the facts being submitted to the jury in writing as a case stated. Upon a motion being made for a new trial, the Judge in granting the motion delivered an opinion from which we make the following quotations:

"The grammatical form of the expression (Section 11 of the Pharmacy Act) 'may be registered' and 'be granted a certificate' is passive, and therefore in

strictness would *not imply an option on the part of the person who was the subject of the action.*"

Then, quoting Section 3, the Judge continued: "The power to register is given to the board, and it is certainly grammatically incorrect to say that it is the duty of the persons who apply 'to be registered.' But such use of language shows that the person who drafted the act was not accustomed to accuracy of logical or grammatical expression, and therefore, that it would *not* be safe to attempt to *construe the act by the aid of grammatical rules.* When it is said that it 'shall be the duty' of certain persons 'to apply to said board and be registered,' the meaning is that it shall be their duty to apply, and, on application, their right to be registered; and so we think that when it is said in sec. 11, that the persons therein designated 'may be registered under this act without examination and be granted a certificate,' the meaning is that, upon application, they shall have the right to be registered without examination. Apart from the language of the act, it would *seem reasonable that a 'graduate of an accredited medical college,* who has had not less than three years' continuous practice since the date of his diploma, and who is registered as a practitioner of medicine and surgery, *ought to be entitled to be registered without examination.* Sec. 6 and the last clause of sec. 10 of the Act expressly reserve the right to physicians to compound their own medicines, drugs and poisons; but a person who is presumed to be qualified to prescribe as well as compound drugs and poisons to his patients, it *would seem ought to be considered to be qualified to compound the same when prescribed by others.* For these reasons and others which might be given, we think the conviction is wrong, and that the judgment must be arrested and a new trial granted, and it is therefore so ordered."

We do not intend to minutely analyze the statements and deductions of this judicial opinion, but mainly direct attention to some parts which we have italicized. The first sentence quoted acknowledges the right of the Pharmacy Board to refuse registration to such applicants. But in the Judge's opinion, section 11 means directly the opposite, because another section (3) is not rendered as grammatically unobjectionable, as might have been done. The preamble of the law states that its object is to secure the *proper qualification* of those keeping a retail drug store; the assumption by the Judge of proper qualification in the case under consideration is entirely extra-judicial, and is not based either upon facts presented, nor upon testimony heard, nor upon his Honor's knowledge of medicine or of the drug business.

REVIEWS AND BIBLIOGRAPHICAL NOTICES.

Mittheilungen aus dem pharmaceutischen Institute und Laboratorium für angewandte Chemie der Universität Erlangen. Von A. Hilger. München, 1890. M. Rieger. III Heft. 8vo. pp. 184.

Contributions from the Pharmaceutical Institute and Laboratory for Applied Chemistry of the University Erlangen.

This pamphlet contains the following essays, based upon researches carried on in the Institute named: Chemical and Microscopical Examination of Coffee and its Substitutes, by C. Kornauth; Estimation of Tartar, Tartaric Acid and

Malic Acid in Wine, with Critical Studies on the Organic Salts of Wine, by Max Schneider; Specific Gravity of Milk Serum and its Importance for the Detection of Milk Adulteration, by P. Radulescu; Critical Studies on the Estimation of Coffeine in Tea, by F. Vité; the Drinking Water of the City of Erlangen, by J. Crone. The first essay named is illustrated by thirteen photolithographic plates of the microscopic appearance of the tissues and powders of twenty articles used as substitutes for coffee.

Untersuchung von Nahrungs- und Genussmitteln, etc.

A reprint from the transactions of the Dorpat Naturalists' Society, giving a brief account of the examinations of articles of food, drink and domestic use, which have been carried on during the past two years under the supervision of Professor Dragendorff.

Artificial Anæsthesia.—A manual of anæsthetic agents and their employment in the treatment of disease. By Laurence Turnbull, M.D., Ph.G., etc. Third edition, revised and enlarged. Philadelphia: P. Blakiston, Son & Co. 1890. pp. 531. Price $2.50.

The importance which anæsthesia has assumed of recent years is readily observed in the increase of size of the present edition as compared with the preceding one, it being over 200 pages. This increase is due on the one hand to the careful revision of the subject matter contained in the preceding edition, necessitating the re-writing of much of the text, and incorporating the recent observations and conclusions in regard to the older anæsthetics; but it should be remembered that since the introduction of cocoaine as a local anæsthetic a very large number of drugs and chemical compounds have been observed to possess more or less of anæsthetic action, and to be adapted for such purpose in special cases. On looking over the long list of these agents, which are treated of in the volume before us, quite a number will be found to be derived from plants which have been employed medicinally for a long time, and it is to be expected that many others will be discovered in the future, either as natural products, or as synthetically prepared compounds. In all its details the work shows the intimate familiarity of the author with its subject, and the watchful care in sifting the facts. While primarily intended for the surgeon and physician who use anæsthetics, the pharmacist will likewise find in it much of especial usefulness. The forty cuts are mostly in illustration of apparatus. Paper and typography leave nothing to be desired.

Report of Willis G. Tucker, M.D., Ph.D., analyst of drugs. Extract from the tenth annual report of the New York State Board of Health.

The samples examined numbered 532, of which 233 were of good, and 54 of fair quality; 24 were of excessive strength, 130 inferior, 58 fictitious, and 33 were not as called for. Of 115 samples of *cream of tartar* collected from grocery stores, 30 only were of good quality, while 25 were more or less adulterated in some cases to the amount of 80 per cent; 58 were entirely fictitious, and two consisted of poor baking powder. Of 49 samples of *compound spirit of ether* eight only were of good or fair quality, the balance consisting mostly of the final distillate in the manufacture of ether. Safflower was furnished 17 times, and crocus martis once, when *saffron* was called for, three samples being true saffron. The 31 samples of *precipitated sulphur* consisted in 16 cases of lac sulphur with a large proportion of calcium sulphate; in 6 cases of washed sulphur;

one sample was strongly acid, and eight were of good or fair quality. The various diluted acids were not unfrequently found to be deficient in strength, or occasionally considerably stronger than they should have been. Twenty-one out of 68 samples of *stronger ether* had an excessive specific gravity. The remaining chemicals and drugs were of good quality, with but few exceptions.

The Preferable Climate for Consumption, or the comparative importance of different climatic attributes in the arrest of chronic pulmonary disease. By Chas. Denison, A.M., M.D., etc.

The author, who is professor of diseases of the chest and of climatology in the Medical Department of the University of Denver, treats of a subject of great importance in the treatment of the disease mentioned. His essay was presented to the Ninth International Medical Congress, and is now republished by order of the Legislature of Colorado.

The reception of the following pamphlets is herewith acknowledged:

The Valedictory Address.—By B. Ogle Tayloe, Phar.D., of the National College of Pharmacy, Washington, D. C.

Analysis of Chocolate and Cocoa.—By Geo. F. Weida, assistant in the University of Kansas.

A History of Spectacles.—By L. Webster Fox, M.D., ophthalmic surgeon to the Germantown Hospital, Philadelphia.

Electrolysis in the Treatment of Stricture of the Rectum.—By Rob. Newman, M.D., consulting surgeon Hackensack Hospital.

A Rational Brace for the Treatment of Caries of the Vertebræ.—(Potts' disease.)

A Practical Splint for Inflammatory Conditions of Joints.

The Treatment of Torticollis.—(Wry-Neck.)

The last three essays are by Dr. Chas. F. Stillman, of Chicago.

A Compend of Chemistry, inorganic and organic; including Urinary Analysis. By Henry Leffmann, M.D., etc. Third edition, revised. Philadelphia: P. Blackiston, Son & Co. 1890. 16mo, pp. 193. Price, cloth, $1; interleaved, 25 cents.

This little book is intended for the student, to save him the trouble of taking copious notes during the lectures, and to aid him in reviewing the subject matter systematically. It outlines the science of chemistry with special reference to the wants of the medical student, thus saving to the latter the time and labor of preparing excerpts—or at least many such—from the larger text-books. Its contents are divided into chapters on general principles, inorganic chemistry, organic chemistry, biological chemistry, urinary analysis and antidotes. That the author, who holds the Chair of Chemistry in several colleges, understands the needs of the students, is shown by the entire make-up of this book, its scope and the clearness and accuracy of its statements; also by its freedom from stereotypic queries and answers, notwithstanding the book is designated as a "quiz-compend." If we were to suggest what in our opinion, would be an improvement, we would recommend that greater prominence be given to those reactions between medicinal agents which result in insoluble, or otherwise strikingly different compounds, causing those agents to be considered "incompatible."

Recovery of absorbed Morphine from the urine, the blood and the tissues. By T. G. Wormley, M.D., etc. Pp. 11.

A reprint from the May number of the *University Medical Magazine*, giving the results of observations on an important subject, which have been made with Professor Wormley's accustomed circumspection.

Upon a Collection of Plants made by Mr. G. C. Nealley, in the region of the Rio Grande in Texas, from Brazos Santiago to El Paso County. By J. M. Coulter. Pp. 37.

This is the second pamphlet issued as "Contributions from the United States National Herbarium." It gives the names, localities of collection and other observations on 903 species of plants collected as stated above.

Identité de la Dengue et de la Grippe-Influenza.—Par le docteur Jules Rouvier, Professeur de clinique obstétricale et gynécologique de Beyrouth. 8vo. Pp. 48. Price, 1 franc.

Identity of dengue with grippe-influenza.

OBITUARY.

Alexander Von Bunge, the nestor of botanist, died in Dorpat, aged 87 years. He was of German descent, born at Kiew in 1803, studied at Dorpat medicine and natural sciences, and took the degree of M.D. in 1825. Accompanying his tutor, Ledebour, the celebrated botanist, in 1826, to Siberia and the Altai Mountains, he subsequently was engaged in botanical explorations in China, the steppes of the Volga, and other parts of the Russian Empire and of Asia. In 1834 he became professor of botany in the University of Kazan, and from 1836 he occupied the same chair in Dorpat, until in 1867 he resigned, afterward devoting his time altogether to scientific researches. His contributions to botany embrace the floras of different sections of Russia, the Altai Mountains, parts of China, Mongolia, etc.

Samuel S. Bunting, Ph.M., a graduate of the Philadelphia College of Pharmacy of 1850, and for many years one of the Trustees, also Treasurer of the College, died at his residence, Greenbank, near Secane, Pa., August 15, 1890. A more extended notice of his life and faithful services to the college will be prepared by the proper committee.

John Franklin Hildebrand, Ph.G., class 1887, died of typhoid fever, eighteen months after graduation, at York, Pa., aged 24 years.

Frank P. Lins, Ph.G., class 1877, died in Philadelphia, May 17th last, of consumption, aged 40 years. He had been in business in this city, but owing to declining health he went to Colorado about two years ago. His death was hastened by an attack of the grippe in January last.

Samuel Robert Means, Ph.G., M.D., died at St. Elizabeth Asylum, Washington, D. C., August 1, in his twenty-seventh year. He was born in Ferguson Valley, Mifflin County, Pa., received his education in the public schools and at the Lewistown Academy, and after graduating from the Commercial College in Philadelphia, entered the drug store of D. L. Stackhouse and graduated from the Philadelphia College of Pharmacy in 1886. In 1889 he received his medical degree from the National Medical College of the Colum-

bian University in Washington, standing first in his class and receiving the highest prize of the college. He next accepted a responsible position in the Children's Hospital, which he filled with credit to himself and to the institution. In June, 1889, he was called to the more responsible post as physician to the Government Hospital for the Insane, St. Elizabeth, where he remained faithful to his charge until after an illness of 18 days his promising career was terminated.

John B. Metzger, Ph.G., class 1881, died at Williamsport, March 16, 1890, of gastric catarrh, aged 43 years. His graduating thesis was on elderberries; an abstract of it was published in this journal in 1881, p. 553.

Chas. Fred. Wm. Pleibel, Jr., Ph.G., class 1879, died suddenly in Philadelphia, August 12, 1890. He had learned the business with his father, Dr. F. Pleibel.

VARIETIES.

Bad Effects of the New Antipyretic.—Excluding the effect of heroic doses and considering only those which are ordinarily regarded as medicinal, Dr. Goldmann is led to the following conclusions:

Antifebrin.—Individual susceptibility to this drug differs widely. Even the smallest doses are capable of giving rise to dangerous symptoms. Especial caution is necessary in using it among children. Its continued administration begets a cumulative action. Collapse, cyanosis, vomiting, and profuse sweating not infrequently result.

Antipyrin.—Neither may any absolute dose be stated of this substance. It also needs to be used with prudence among children. It also possesses a cumulative power. Exanthems, collapse, cyanosis, dyspnœa, vomiting, and excessive perspiration are often its effects. That death sometimes follows the exhibition of comparatively small quantities admonishes us to prudence.

Phenacetin.—Eruptions and copious sweats are not infrequently occasioned the latter especially in persons predisposed to free perspiration. Cyanosis and collapse are of less common occurrence. It should be given cautiously to children.

Without expecting it to take the place entirely of the other two bodies, phenacetin may well be preferred to them in many cases, especially in regard to the fact that it is less liable to create embarrassing and dangerous manifestations.—*Med. Bulletin.*

Ammonium Bromide Inhalations are recommended in asthma by Dr. Th. Maxwell (*Lancet*, May 10). Strong hydrobromic acid, spec. grav. 1·7, may be used together with ammonia water. But since it is difficult to thus obtain absolutely neutral fumes with the ordinary inhalers, an apparatus was constructed in which the ammonium bromide is simply vaporized by heat and drawn through a wash bottle before being inhaled.

The antiseptic action of iodoform appears to be very feeble. According to the observations of many investigators, it does not prevent the growth of micro-organisms, although it may, perhaps, be decomposed by the secretions of wounds so as to set free the iodine, and thus exert an antiseptic action.—*Jour. Amer. Med. Assoc.*, May 10, p. 686.

THE AMERICAN
JOURNAL OF PHARMACY.

OCTOBER, 1890.

MEMOIR OF SAMUEL S. BUNTING.

Samuel S. Bunting, for many years a member of the Philadelphia College of Pharmacy and of its Board of Trustees, deceased on the 15th of August, 1890, in the 63d year of his age. He was born on the 23d of April, 1828, at No. 913 Spruce Street, in this city. His family were among the early Quaker settlers of Pennsylvania, who, since their arrival from England, have been residents and land-owners for several generations near Darby, in Delaware County.

His father, Josiah Bunting, was engaged in the lumber business, at the southeast corner of Eighth and Vine Streets, under the firm name of Bunting & Watson; his junior partner was at one time Mayor of the city of Philadelphia. His mother, Sarah Sellers, was a descendant of the Delaware County family of that name; her father was one of the early promoters of the industry of wire manufacturing in this city.

When Samuel was quite a child, his father retired from the lumber business, and removed to the old family home at Darby, where Samuel resided until he came to Philadelphia, in 1845, at the age of 17 years, as an apprentice to the drug and apothecary business, with Joseph C. Turnpenny, at the northeast corner of Tenth and Spruce Streets.

He received an elementary education at Friends' Monthly Meeting School, at Darby, supplemented by a course of lectures on chemistry and astronomy given by John Jackson, an able teacher in charge of the Sharon Academy for girls, in Darby. It does not appear that he manifested any particular disposition toward the

business of pharmacy, but accepted the position offered to him by Mr. Turnpenny as an opportunity for learning a business which promised him a comfortable maintenance. He graduated at the Philadelphia College of Pharmacy in the class of 1849–50. He was married in 1857, to Anne H. Hibberd, of Upper Darby, at the house in which he afterwards departed from this life. About the time of his marriage he became a partner in business with Mr. Turnpenny, and in 1864 purchased his interest and conducted the store in his own name. He became a member of the Philadelphia College of Pharmacy in February, 1855, and in March, 1856, was elected to its Board of Trustees, serving in that capacity until his decease. In September, 1871, he was chosen Treasurer of the College, and continued to hold that position until November, 1889, when failing health caused him to present his resignation.

In the summer of 1860 he met with an accident by the sudden displacement of the stopper of a large bottle of concentrated ammonia water, a portion of the liquid was thrown into his face, inflicting an injury which threatened a total loss of his sight. From this accident he suffered during the remainder of his life, although recovering in a fair measure his sight, it was never entirely restored, and the nervous shock received told upon his constitutional vigor during the remainder of his life.

In June, 1886, he retired from business, and lived a quiet life at his home in Delaware County, but continued to manifest an active interest in the affairs of this College. In 1889, his health failed rapidly until the peaceful ending of his life in August last.

Mr. Bunting was a man of unassuming manner, his diffidence and modesty obscuring his real worth to those not well acquainted with him. His sterling integrity and the faithful performance of his duties have left their record with all who have had relations with him. The quiet and even tenor of his life, in its simplicity, has left with us a pleasant memorial of one of the old useful and valued members of this College.

His wife, one son and three daughters survive him. C. B.

Nitrite of amyl is commended as the most rational and successful antidote to use where chloroform or cocaine seem to threaten life by their unfavorable action on the heart. A few drops of nitrite of amyl administered by inhalation will be one of the most probable means of restoring the heart's action.—*Jour. Am. Med. Assoc.*, April 5, p. 508.

ON THE ETHEREAL OIL OF POLYGALA SPECIES.

By Henry C. C. Maisch.

Read before the American Pharmaceutical Association, at Old Point Comfort, Va., Sept. 10.

Although the peculiar odor of senega root was probably early noticed, Langbeck (*Beckurts' Jahresbericht für Pharmacie, Pharmakognosie und Toxicologie*, 1881–1882) is the first author I can find whose publication has direct bearing on the subject.[1] He states that a three year old senega root possessed a decided odor of salicylic-acid-methyl-ester or oil of wintergreen. After distilling the root with water he estimated, by means of ferric chloride and comparison of the color thus obtained with an aqueous solution of oil of gaultheria treated in like manner, the amount of oil present to be 0·225 per cent. A twelve months' old root gave a color reaction which pointed only to traces of the oil.

L. Reuter (*Archiv der Pharmacie*, 1887, 227, p. 313) estimated the characteristic constituents of Polygala Senega with the intention of basing thereon an assay of the root. He found southern senega to contain 0·28 per cent., and northern 0·25—0·33 per cent. of the ethereal oil.

The same author (*l. c.*, p. 459 and 549) gives two methods for determining the presence of oil of wintergreen in the root.

"Five gm. of the air-dried root treated with 50 cc. water of about 60° C., should after 15 minutes give a filtrate which, on acidifying with 3 drops of hydrochloric acid and extracting with 50 cc. ether, yields to this sufficient salicylic acid, so that on taking up the residue, remaining after the spontaneous evaporation of the ether, with 20 cc. water of 60° C., and adding one drop of solution of ferric chloride, a distinct violet color should appear."

The second method, to which Reuter gives the preference as the sharpest is as follows:

"Five gm. of the air-dried and cut root are macerated with about 30 gm. ether for ½—1 hour, when the ethereal extract is filtered into a beaker containing 20 cc. water of about 40—50° C., and a dilute solution of ferric chloride added; the aqueous solution assumes a violet color, the supernatant layer of fatty oil and resin having no effect on the reaction."

[1] The presence of a volatile principle in senega root was recognized by Peschier (1821), Feneulle (1826), Dulong (1827), Folchi (1830) and others.

On examining the false or white senega, the root of *Polygala alba*, Reuter obtained evidence of only traces of the oil, while a Japanese senega, obtained of Professor Shimoyama and probably the root of *P. tenuifolia*, did not contain a trace.

Through the kindness of Mr. Theodor E. Melter, of Jacksonville, Florida, Prof. J. M. Maisch obtained some specimens of the herb *Polygala Baldwinii*, which was placed at my disposal. Mr. Melter stated it to be a powerful diuretic, and to have a strong odor of oil of wintergreen. A subsequent quantity consisting of fresh root and herb had spoiled on the road; so I had to content myself with the examination of the air-dry herb alone.

The herb, which had been in Prof. Maisch's possession a short time, showed evidence of 0·08 per cent. of ethereal oil estimated by Reuter's first method, and the colorimetric comparison of the ferric chloride reaction. Although the second quantity spoken of before had become mouldy, it was nevertheless examined when I could not get evidence of even a trace of the oil.

During the next season I will endeavor to obtain some more of this plant, both root and herb, and besides intend to examine, in the same manner, as many of our indigenous Polygalas as I can procure, hoping to be able to report on the subject at the next annual meeting.

ARTEMISIA FRIGIDA, *WILLDENOW.*

By Frederick A. Weiss, Ph.G.

From an Inaugural Essay.

The plant named above is known in Colorado as *sierra salvia*, or *Colorado mountain sage*, and as a medicinally valuable herb has obtained considerable repute throughout the Western States. Originally employed by the "medicine men" of the Western Indian tribes, it was through them made known to the early white settlers of that region. Its constant use in that section, with excellent results, has established its value as a remedy, although it has been but little employed elsewhere. Its medicinal properties are there regarded as being of a very high order, both by the laity and the profession, as a cure for the well-known "Western Mountain Fever." It is given in the form of hot infusion, sweetened to the taste, with the addition of a small quantity of capsicum; which latter, by stimulating absorption, apparently increases its effectiveness. The hot infusion has a diuretic, an antiperiodic and some-

times a mild cathartic action. The fluid extract is now being made quite extensively, but the old preference in favor of the infusion prevails. Good authority recommends its use in convalescing cases of scarlatina and diphtheria, given as a cold infusion [two troy ounces to the pint], one wineglassful as a dose, three times a day, and at bed-time when action on the kidneys is desired.

The herb is growing among the Rocky Mountains, from Colorado to Idaho, at altitudes from 4,500 to 9,000 feet above the sea level, either in dry, sandy localities, among rocks, or in the lower valleys, and occasionally upon the more fertile plains; but it is never found in swampy regions. The plant consists of a small cluster of grayish green leaves, forming a tuft close to the ground, in the midst of which are sent up numerous slender, round, or frequently pentangular, tough and fibrous shoots, rarely exceeding twelve to fourteen inches in height, having the two-fifths ranked arrangement of the leaf. The lower portion of the herb is perennial, while the shoots are annually replaced. The tap root is rarely exceeding five inches in length, and has numerous fibrous rootlets attached. The herb retains its vitality during the summer months despite the fact that it is almost anhydrous. The inflorescence is of the racemose type. When poorly nourished, it becomes a raceme, purely, but under more favorable circumstances develops into a more perfect panicle. Each peduncle is furnished with a soft, velvety bract, and the pedicel is accompanied by a bractlet. The receptacle is surrounded by a dense, closely compact involucre, and contains from twenty to thirty akenes, somewhat resembling Timothy grass seed, but smaller and darker. For medicinal use, the overground portion should be gathered during the early fall, when its medicinal qualities have been found to be the greatest.

An analysis was made, following the method of Dragendorff, the mixture of stems, leaves and flower-heads, as medicinally employed, being first finely ground; the result is given in the annexed table :

ARTEMISIA FRIGIDA.	Per Cent.
Moisture,	12
Ash,	9·5
Petroleum ether extract, containing volatile oil, fat, wax and chlorophyll,	5·5
Ether extract, containing bitter principle,	2·5
Absolute alcohol extract, containing tannin and bitter principle,	2·75
Water-soluble matter, cellulose, etc.,	67·75

The ash consisted of sulphates, phosphates and carbonates of potassium (predominating), sodium (trace), magnesium, calcium and iron, with some silica.

The soft ether extract had a persistently bitter taste; its filtered aqueous solution did not respond to the group-reagents for alkaloids, but with Fehling's solution gave a red-brown precipitate indicating the probable presence of a glucoside.

The alcohol extract was likewise bitter, but less so than the ether extract; the aqueous solution contained tannin, and gave a slight indication of the presence of a glucoside, but not of alkaloid.

By precipitating the aqueous infusion with tannin, treating the precipitate with oxide of lead, drying, exhausting with alcohol, decolorizing with animal charcoal, evaporating, and purifying with ether, a semi-transparent mass was obtained, having a bitter taste, being soluble in alcohol or ether, but almost insoluble in chloroform. Experiments to ascertain its probable glucosidal nature were not made.

CHEMICAL NOTES.

By Henry C. C. Maisch, Ph.G., Ph.D.

Luffa echinata, Roxburgh.—Dymock and C. H. J. Warden (*Pharm. Journ. and Trans.* 1890, xx, 997) by extracting the fruit, freed of the seeds, with alcohol, obtained a body which is probably identical with *colocynthitin*, and also a new compound *luffeïn*. The latter has such gelatinizing properties, that 0·1 gm. added to 100 cc. water forms a gelatinous mass. Luffeïn differs from pectin, gum, etc., in that it is soluble in alcohol.

Estimation of Caffeine in Tea.—F. Vité (*Mittheil. a. d. pharm. Inst. Erlangen* No. 3, p. 113–143) simplified the method of Hilger (*Archiv d. Pharmacie* xxiii, 1885, 827) as follows: 5 gms. of tea powder (sieve: mesh width 2 mm.) are extracted three times with 300 cc. water for one hour. The infusion is evaporated to one-fourth its volume and mixed with freshly precipitated hydroxide of lead and coarse sand. This mixture is then evaporated to dryness on a waterbath and the residue transferred to an extraction apparatus, where it is treated with chloroform for three hours. The extract remaining after driving off the chloroform is dissolved in hot water, filtered into a tared crystallizing dish, evaporated and the residue dried at 100° C.

Croton oil.—L. Reuter (*Apoth. Zeitg.* 1890, v, 320, 362) found that the solubility of the neutral glyceride in absolute alcohol is due to or increased by the presence of free croton-oleic acid. The amount of free acid varies with the method of preparation of the oil as also do some other constituents. The oil occasionally contains an albumin modification and a glucoside.

On Lycopodium Oil.—A. Barkowski (*Warschau, Universit. Nachricht.*, 1889. No. 3–4), by triturating the spores of Lycopodium clavatum with glass and extracting with ether, obtained 48·5 per cent. of a neutral, non-drying oil, which is similar to expressed oil of almonds. The oil contains I, a new fatty acid (*lycopodic acid*), $C_{18}H_{36}O_4$, 2 per cent.; II, a phytosterin (vegetable cholesterin), 0·3 per cent.; III, oleic acid, 80 per cent.; IV, arachic, stearic and palmitic acids, 3 per cent.; V, glycerin, 8·2 per cent. The phytosterin is similar or probably identical with that obtained by Hesse from Calabar beans. It crystallizes in hexagonal tablets or silky acicular crystals, which melt at 132°–133° C. The composition is $C_{25}H_{42}O$. Lycopodic acid forms small, silky doubly refracting needles, which melt at 91–92° C. It is an isomere of dioxy-stearic acid.

On Cassia Oil.—According to Schimmel & Co. cassia oil is occasionally adulterated with colophony and petroleum. Ed. Hirschsohn (*Pharm. Zeitschr. f. Russl.*, 1890, xxix, 225–30, 241–44) proposes the following methods for detecting these adulterations: Shake the oil with three times its volume of petroleum ether (sp. gr. 0·650) in a graduated cylinder. In case a diminution in volume should take place, the presence of other ethereal oils, fatty oils, resin or kerosene is indicated; in case of an increment of volume castor oil is very likely present. On shaking the clear extract obtained with petroleum ether with oxide or hydrate of copper, it must not yield a green or blue filtrate. The presence of the color points towards colophony or copaiba balsam. One volume of oil must give with three volumes of 70 per cent. alcohol at 15° C. a clear or only opalescent solution. A turbidity or precipitate makes the presence of petroleum, other ethereal or fatty oils, or larger quantities of colophony very likely. The solution in 70 per cent. alcohol treated with an alcoholic lead acetate solution (70 per cent. alcohol saturated at the temperature of the room), drop by drop, until one-half the volume is added, must not give a precipitate, which would show the presence of colophony or a similar resin.

On the micro-chemical detection and the distribution of dulcite in the vegetable kingdom.—J. Borodin (*Revue des Sciences Nat., St Petersburg*, 1890, No. 1, p. 26–31 and 55) found dulcite in Melampyrum nemorosum. On treating the sections with alcohol, dulcite separates in relatively large prismatic crystals somewhat similar to saltpetre and asparagin. It differs from these (1) in that the crystals are insoluble in a saturated solution of dulcite in water, and (2) on heating to 190° C. dulcite decomposes forming a dark-brown blistery mass. The carbohydrate is found in all parts of M. nemorosum, M. pratense and M. silvaticum and furthermore in four other species, which were taken from an herbarium. The examination in this case was as follows: The leaves were rubbed to a powder between the fingers and extracted with dilute alcohol, and the solution evaporated on a watch-glass; or the leaves were softened in water and then treated as if fresh. Other scrophulariaceous species, like Rhinanthus Crista galli and Scrophularia nodosa, were found to be absolutely free from dulcite. The plants of the order Celastraceæ contain dulcite, which was found in eleven species of Euonymus, three of Celastrus, and one of Schaefferia.

Haplopappus Baylahuen, C. Gay (*Hysterionica Baylahuen, Baillon.*)—Rusby (*Drug. Bull.*, iv, No. 2, p. 39) examined this plant which is used in the province of Coquimbo as an antihystericum and in veterinary medicine for treatment of wounds. He found a volatile oil, a fatty oil, this having the specific odor of the plant, a brown acid resin of sharp taste and tannin. The taste is said to resemble pichi.

GLEANINGS FROM THE GERMAN JOURNALS.

By Frank X. Moerk, Ph.G.

Herniaria glabra.—In addition to the known constituents of this plant herniarin (methyl-umbelliferon) and saponin, Dr. Schneegaus finds also an alkaloid, called paronychine. It is present in minute quantity only, and is extracted by treating the drug with dilute alcohol containing tartaric acid, evaporating, taking up in water, making this solution alkaline and agitating with ether; after conversion into the sulphate it is precipitated by phospho-tungstate of sodium and the alkaloid obtained pure from this precipitate by treatment with baryta and solution in ether. The acetate with a weak solution of cerium sulphate in concentrated sulphuric acid

gives a violet-blue coloration; similar colorations are obtained with bichromate of potassium and ferric salts and sulphuric acid.—*Journ. Pharm. Els.-Lothr.*, 1890, 206.

Artificial musk has the chemical name, trinitro-isobutyltoluol and formula $C_6H(CH_3)(C_4H_9)(NO_2)_3$. It is made by slowly adding pure isobutyltoluol (b. p. 185° C.) to five times its weight of a mixture containing one part fuming nitric acid sp. gr. 1·5 and two parts fifteen per cent. fuming sulphuric acid; the mixture must be chilled to prevent rise in temperature. After standing for some time it is heated for twenty-four hours in a waterbath; addition of water precipitates a nitro-product which must again be nitrated to yield a pure trinitro derivative, this after precipitation by water is recrystallized from alcohol. It forms yellowish-white needles, melting at 96–97°C.; insoluble in water, it is easily soluble in alcohol, ether and chloroform. Physiological experiments by Dr. Hepp, of Mülhausen, made with animals prove its non-poisonous character. The mono- and di-nitro derivatives of isobutyltoluol have an unpleasant odor not at all resembling musk. Trinitro-isobutylxylol has an odor of musk but not at all comparable with the toluol derivative.—Dr. A. Baur, *Chem. Ztg.*, 1890, 1093.

Preparation of oxygen.—Dr. George Kassner noticed that barium peroxide brought in contact with potassium ferricyanide in presence of a little water liberated a gas found to be almost pure oxygen. The evolution of gas is attended with a change of color, the ferricyanide being changed to ferrocyanide; if sufficient water is used, the product remaining in the generator dissolves completely, excepting the impurities of the BaO_2. The reaction for this process is given: $BaO_2 + K_6Fe_2(CN)_{12} = Ba(K_3Fe(CN)_6)_2 + O_2$.—(*Ztschr. f. angew. Chem.*) *Apoth. Ztg.*, 1890, 484.

Sterilizing of drinking water.—Various chemicals have been proposed for this purpose, of which ferric chloride, alum, tannin and potassium permanganate have been used, but it was found that these to be effective had to be used in quantity which imparted an unpleasant taste to the water. Recently Hettinga Tromp proposed hydrogen peroxide as the ideal substance to sterilize water as it imparted neither odor nor taste and was harmless and efficient; one part was added to 3,000—10,000 parts of water. Dr. Altchoefer confirms the efficiency of hydrogen peroxide but asserts that 1 : 1000 must be used; after 24 hours' standing the water microbes as well as pathogenic

microbes (cholera, typhus) will be destroyed. In using hydrogen peroxide 10 cc. of a 10 per cent. solution is added to a liter of water.—(*Cntrlbl. f. Bakt u. Parasitenk.*) *Apoth. Ztg.*, 1890, 485.

Coffee.—To detect spurious coffee in presence of the genuine beans, J. Samelsohn places a number of the beans in ether, separating at once those beans sinking below the surface; if these be broken open along the groove and it be found that the membraneous testa is missing, the artificial product is unmistakably recognized.—(*Ztschr. f. angew. Chem.*), *Apoth. Ztg.*, 1890, 502.

Color reaction of isocholesterin.—This body found in wool-fat by E. Schulze will give the following test: If as little as one milligram be dissolved in 2 cc. chloroform, 10 drops acetic anhydride and two drops concentrated sulphuric acid added a yellow color is produced, passing after a time into a reddish yellow, the liquid also showing a green fluorescence.—*Ztschr f. Physiol. Chemie.*, 1890, 522.

A new method for the saponification of fats, waxes, etc.—The fat, etc., is dissolved in ether and an alcoholic solution of sodium ethylate (C_2H_5ONa) added; after a short time a compact precipitate forms which consists of the sodium soaps, the nature of which allow a rapid filtration and washing. For 100 to 150 gm. fat the sodium ethylate formed by dissolving 10 gm. metallic sodium in 150 to 200 cc. absolute alcohol is necessary, although it is preferable to insure complete saponification to use 2 to 3 times the quantity of sodium dissolved in the above quantity of alcohol; it is also advisable to allow twenty-four hours' time for the saponification. The very difficultly saponifiable wool-fat is very easily saponified under these conditions. Instead of preparing the sodium ethylate, metallic sodium can be added to the alcohol-ether solution of the fat; the sodium becomes coated with a layer of soap, which, upon agitation, easily separates. This method is especially adapted to the study of those fat, etc., constituents, which, after saponification, are soluble in ether, the small quantity of soap dissolving in the ether being removed by agitation with several portions of water.—A. Kossel and K. Obermüller, *Ztschr. f. Physiol. Chemie*, 1890, 597.

Detection of albumenoids.—Traces of albumenoids may be detected by exhausting the substance to be tested with lukewarm water, filtering, evaporating to a small bulk, adding an excess of potassium hydrate and some copper sulphate, and evaporating to dryness; the

dried residue is heated in a porcelain crucible, when if albumenoids were present the odor of trimethylamine is developed. The copper sulphate is added to oxidize sugar, which is generally present and prevent the formation of empyreumatic vapors, which might interfere with the recognition of the trimethylamine odor. This test will serve to distinguish flour and starch.—Dr. M. Dahmen, *Pharm. Ztg.*, 1890, 555.

The color reaction of peppermint oil with acetic, sulphuric and hydrochloric acids (formation of a blue color with red fluorescence) has been investigated by Dr. E. Polenske. If 3 cc. hydrochloric acid sp. gr. 1·124 be agitated with twenty drops of the oil and slightly warmed, a violet color will finally result; if twice the volume of ether be then added, the color will be imparted to the acid, which separated and diluted with an equal volume of water, will give a precipitate of blue color, while a red coloring principle will remain in solution; the red filtrate shows no fluorescence, while the acetic acid or alcoholic solution of the thoroughly washed blue precipitate possesses a red fluorescence. A better yield of the blue color was obtained by adding 4 drops concentrated sulphuric acid to 20 cc. oil, agitating, warming to 40° C., allowing to stand several hours with occasional agitation, adding 80 cc. ether, shaking with two portions of hydrochloric acid of two cc. each, separating the acid and proceeding as above. Addition of ammonia to solutions of the colors causes decolorization, from such solutions ether will extract a brownish substance (free from nitrogen), which, with acids, will produce again the original colors. The ethereal residue exposed to sun-light for a short time is bleached, and then no longer gives the colorations on addition of acids. Peppermint oil exposed for 3 to 4 hours to sun-light does not lose the property of coloring with the acids, but after twenty-five days' exposure it will no longer respond. The substance producing the colorations is volatile in a current of steam, and is, therefore, present in rectified oils.—*Pharm. Ztg.*, 1890, 547.

Solanaceæ Alkaloids.—To ascertain the nature of the pre-existing alkaloids in this natural order, Prof. E. Schmidt had Mr. Schütte carry out a number of investigations, the results of which are here given: young and old belladonna roots (one to two and eight or more years old, respectively) were collected at different periods of the year; upon examination they yielded the following average

alkaloidal percentage: Young roots, Spring 0·127 per cent., Summer 0·452 per cent., Autumn 0.458 per cent.; old roots, Spring, 0·174 per cent., Summer 0·358 per cent., Autumn 0·280 per cent. The alkaloid from the *young roots* consisted entirely of hyosciamine, from the *old roots* chiefly of hyosciamine with very small quantities of atropine. In the *leaves* of the uncultivated belladonna, collected in Spring and Autumn, much hyosciamine with little atropine was found; the ripe *fruit* contained only atropine. The keeping of dried belladonna root does not produce any change of the pre-existing alkaloid, an apparently young root kept for 10 years in a store containing only hyosciamine. The process by which these results were obtained is not published, but it is stated that its reliability was established by adding hyosciamine and a mixture of hyosciamine and atropine to powdered glycyrrhiza and isolating the alkaloids; no change of the alkaloids had taken place.

In stramonium seeds much hyosciamine with small quantities of atropine and hyoscine was found.

Of Duboisia leaves two specimens were examined, one of which contained chiefly hyosciamine, the other only hyoscine.

In the potato plant, in Solanum nigrum, in Lycium barbarum and in Nicotiana tabacum traces of mydriatic alkaloids were found, which possessed certain resemblances to the belladonna alkaloids; these will be more fully investigated.—*Apoth. Ztg.*, 1890, 511.

Tritopine.—In working up large quantities of mother liquor resulting in the extraction of morphine, E. Kauder obtained a crystallized alkaloid differing from all the alkaloids isolated by O. Hesse and which is named *tritopine*. This alkaloid towards sulphuric acid shows resemblance to laudanosine and laudanine. It has the composition $C_{42}H_{54}N_2O_7$. Its salts are easily soluble in water and alcohol.—*Arch der Pharm.*, 1890, 419.

Chelidonium majus.—There are present in this plant besides chelidonine and chelerythrine three other alkaloids called α-homochelidonine $C_{21}H_{21}NO_5$, β-homochelidonine $C_{21}H_{21}NO_5$ and protopine (?). α-homochelidonine and β-homochelidonine have like formulas but differ towards reagents, while the latter with concentrated sulphuric acid gives an immediate violet coloration the former is dissolved without color but after some time becomes yellowish; they differ from chelidonine $C_{20}H_{19}O_5$ by an additional CH_2. The fifth alkaloid protopine (?) in all its properties resembles protopine obtained by

Hesse from opium, it also resembles *macleyine* found by Eyckman in Macleya cordata, and the alkaloid present in Stylophoron root. The alkaloids can be obtained in the following manner: The powdered material is extracted with alcohol containing acetic acid, water is added and the alcohol distilled off, the aqueous solution is filtered, made alkaline with ammonia and extracted with chloroform, the latter is distilled off and the residue treated with alcohol containing HCl, in which the hydrochlorates of protopine and chelidonine are insoluble. The alcoholic solution, after addition of water, is distilled, the aqueous solution diluted with water containing HCl filtered and ammonia added in excess; β-homochelidonine remains in solution and is obtained by extraction with chloroform; the precipitated chelerythrine and α-homochelidonine is treated with ether which removes the chelerythrine.—Dr. F. Selle, *Arch. der Pharm.*, 1890, 441–462.

Veratrum Album.—An alkaloidal examination of this rhizome by George Salzberger revealed the presence of the following alkaloids having the formulas:—Protoveratrine $C_{32}H_{51}NO_{11}$, Protoveratridine $C_{26}H_{45}NO_8$, Pseudojervine $C_{29}H_{43}NO_7$, Jervine $C_{26}H_{37}NO_3$ and Rubijervine $C_{26}H_{43}NO_2$.—*Arch. der Pharm.*, 1890, 462–483.

ABSTRACTS FROM THE FRENCH JOURNALS.

TRANSLATED FOR THE AMERICAN JOURNAL OF PHARMACY.

DATURIC ACID, a new fat acid, has been prepared by M. Gérard, (*Comptes rendus, Acad. des Sci.*, Aug. 11) from the seeds of Datura Stramonium, which yield 25 per cent. of oil when extracted by ether. Purified with petroleum, this oil was of a greenish-yellow color. It was saponified with litharge; then the lead oleates were removed by ether, leaving a soap, from which the author isolated an acid fusing at 55° C. M. Gérard places daturic acid between palmitic and stearic acids, and it presents analogous properties to these. It crystallizes by cold from 85 per cent. alcohol, giving groups of fine needles. It is fairly soluble in cold alcohol, and very soluble in ether and benzin. It has the formula $C^{34}H^{34}O^4$ (old notation).—*Répert. de Phar., Sept. 10.*

ANTISEPTOL, OR IODO-SULPHATE OF CINCHONINE.—M. Yvon (*Nouv. Rem.*) makes this preparation, for therapeutic use, as follows: The sulphate of cinchonine is dissolved in water, using 25 gm. of the salt to 2,000 gm. of water, and the precipitate formed by the use of

an iodated iodide of potassium prepared after the following formula: Iodine, 10 gm.; iodide of potassium, 10 gm.; water, 1,000 gm. The reagent should not be used in excess. The liquor should always be allowed to retain a little of the sulphate of cinchonine. The product is placed on a filter, and is washed with water until the latter no longer contains iodine, after which it should be dried in the open air. The iodosulphate of cinchonine is a well-defined product, which contains 50 per cent. of iodine. It may be obtained crystallized, but for medical uses it is best made in accordance with the formula described.

Chloroformic Digitalin.—In a long article on the active principles of digitalis, Dr. Bardet (*Nouv. Rem.*, July 24) presents his conclusions as follows: 1. In order to feel assured that we may obtain a product of even activity, we should always prescribe chloroformic digitalin. 2. All chloroformic digitalins should be *totally* soluble in chloroform. 3. There is an equality of action between crystallized digitalin and amorphous chloroformic digitalin. German digitalin, or digitalein, are products having so great an inequality of action, that they should be excluded absolutely from therapeutics.

Aristol Plasters.—M. Cavailles makes these for the Hôpital Saint-Louis by mixing finely powdered aristol with a small quantity of oil, and adding to a mass of lanolin and caoutchouc plaster, previously cooled and made very fluid by the addition of benzin. The benzin is evaporated to a sufficient degree to leave a preparation suitable for spreading upon muslin. The plasters are said to possess the full antiseptic properties of aristol applied in other ways. The author makes plasters of iodol, iodoform, salol and chrysarobin in the same manner.—*L'Union Phar.*, July.

Burns from Hydrofluoric Acid.—M. Desvignes (*Répert. de Phar.*, Sept. 10) describes the case of an engraver on glass whose skin was burned while handling hydrofluoric acid. The treatment recommended is to wash the burned parts with a largely diluted milk of lime or magnesia. Ammonia is used, but is usually made too strong, considering the small quantity of hydrofluoric acid present, and the excess of ammonia has too caustic an action on the burned skin.

Rapid Preparation of Mercurial Ointment.—M. Passérieux proposes a method, which consists of putting a small quantity of

lard into a mortar with the mercury and working it until the extinction of the metal, adding, at the same time, drop by drop, a small quantity of water charged with oxygen. Ten drops of this water are added for each 100 gm. of mercury, this amount being quite sufficient to insure rapid work. The operation is terminated by adding the remainder of the lard.—*Bull. de la S. de Phar. de Bordeaux*, July, 1890.

A New Excipient.—According to the *Jour. de Conn. méd.*, Aug. 7, M. Adam, a Parisian pharmacist, has produced a resin soap "which may be recommended as constituting a new pharmaceutical excipient." The formula is as follows: Resin, 100 parts; carbonate of potash, 30 parts; water, 300 parts. The components are heated to the boiling point, when an effervescence takes place, the product being finished when the disengagement of gas ceases. The heat may be continued, however, until any desired consistency is obtained. The product may be made hard, if necessary. This soap is soluble in water, and does not give a precipitate with marine salt. It may be used as an excipient for a great many drugs, and it has the advantage of being less costly than either vaseline or cerate. It should not be used with metallic salts, owing to the liability to double decomposition. Resin soap works well with mercury and mixes freely with camphor, naphthol, sulphide of carbon, tar, etc. It does not make a homogeneous product with the oil of cade. It appears to have been serviceable thus far in the preparation of some of the remedies used by veterinary surgeons.

ARISTOL.

By Leopold Larmuth.

Although aristol has been in the hands of the profession such a comparatively short time, an extensive series of publications of experience of its use has appeared, which, for the most part, quite confirms the very favorable results recorded by Eichhoff[1] of its use. Dr. Brocq[2] reports a remarkable case which he presented to the Société Médicale des Hôpitaux—a patient suffering from extensive superficial epithelioma of the face, extending from the level of the

[1] "Ueber die dermat.-therap. Wirksamkeit einer neuen Jodverbindung, das Aristol."—*Monatsh. f. prakt. Dermat.*, X., No. 2.

[2] *Bulletins et mém. de la Société Médicale des Hôpitaux de Paris*, 1890, No. 13.

mouth to the orbit, the lower eyelid being completely destroyed. The healing action in this case was at once evident, and in five or six days the wound was becoming covered with a firm cicatrix, and at the time the patient was presented to the Society, after use of the remedy for three weeks, only very small wounds remained. Dr. Brocq has also had most gratifying results in other cases in which he has used the drug, especially ulcers of the legs and ulcerated gummata.

Dr. Gaudin[3] reports cases of psoriasis, ulcers, eczema, and chancre, in which he has used the drug with most excellent results; in one case of ulcer of the leg, in which he made comparative experiments with iodoform and hydrarg. biniodide, the result with aristol far exceeded that with the other drugs. In all his cases the marked property of the drug in favoring cicatrization was most striking. Dr. Gaudin applied the drug either dissolved in ether or collodion, or as a dusting powder.

Dr. Hughes[4] has found the drug of much service in all those forms of rhinitis associated with a dryness of the mucous surface, or in which there is a tendency for the secretion to undergo decomposition. He reports twenty-one cases in which he has tried the remedy, and in all the result was most satisfactory; in two cases of specific ozœna the disappearance of the fœtor and the healing was very rapid.

Dr. Löwenstein[5] has treated four cases of ozœna with the drug, and reports most favorably on its effects in one case of specific ozœna. In addition to insufflation of the drug in powder, he painted the ulcerated parts with a solution in collodion flexile. He speaks very favorably of the property the drug has of forming a covering over the diseased surface.

Professor Neisser[6] has made experiments on the action of aristol on bacteria, and also used it therapeutically in thirteen cases of lupus exulcerans, in which he found it of great service. In lichen rubra, soft chancre, and gonorrhœa the results were not satisfactory.

Dr. Schirren[7] has treated ten cases of psoriasis of various forms,

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[3] *Journal des Malad. Cutan. et Syphil. de M. le Dr. Fournier*, 1890.
[4] *Deutsche med. Wochenschr.*, 1890, Nos. 18 and 19.
[5] *Internat. klin. Rundschau*, Wien, Mar., 1890.
[6] *Berlin klin. Wochenschr.*, 1890, No. 19.
[7] *Berlin klin. Wochenschr.*, 1890, No. 11.

vulgaris, guttata nummularis, with aristol, and reports all the cases as cured after, at longest, twelve days' treatment. He applied the drug as 10 per cent. ointment in lanolin or vaselin, or with zinc starch. In none of the cases was any ill by-effect observed.

Dr. Schuster[8] records a case of syphilis of the naso-pharynx, in which he had a very good result, after the use of aristol in powder. The case had been under treatment for some months without any benefit, potassium iodide being administered internally and mercury by inunction. Dr. Schuster reports also a case of psoriasis in which he used aristol with very rapid and good results. He applied a 10 per cent. solution of the drug in collodion flexile.

Dr. Seifert[9] has made an extended trial of the new drug in the syphilis clinic at Würzburg, and reports very favorably on its use. He has used it in ulcers of the leg, lupus, psoriasis, moist condylomata, and suppurating gummata, and in all cases in which it was applied the good result was most marked. Dr. Seifert states that he did not find any iodine in the urine when aristol was administered internally.

Dr. v. Swiecicki[10] has made a trial of the drug in gynæcological practice. He has used aristol in twenty cases, and in all the drug has had a beneficial action. The cases reported comprise endometritis, hyperplasia of the cervix, parametritis, eczema vulvæ, and, after operation for fissure of the cervix, applied as a dusting powder. —*The Medical Chronicle*, July, 1890.

CHINESE CINNAMON.[1]

By Henry Humphreys, Ph C., Hong-kong.

It is generally supposed that Chinese cinnamon is the same thing as cassia, but there is reason to believe that this is not the case. One day I noticed our Chinese manager take a piece of bark out of his pocket, cut a bit off, and put it in his tooth. He explained that it was cinnamon, and that it was used to stop his toothache. I looked at the bark and asked him if it was not cassia he meant. He smiled complacently and remarked: "One does not pay five dollars an ounce for cassia." I have since investigated the matter,

[8] *Monatsh. f. prakt. Dermatologie*, X, No. 6.
[9] *Wien. klin. Wochenschr.*, 1890, No. 18.
[10] *Oest.-ung. Centralbl. f. d. med. Wissenschaften*, 1890, No. 2.
[1] *Phar. Jour. and Trans.*, Aug. 16, 1890, p. 123.

and although unable to identify the "Chinese cinnamon" plant with Ceylon cinnamon, owing to the impossibility of obtaining the flowering branches, the results of my inquiries tend to show that Chinese cinnamon differs very materially from ordinary *Cassia lignea*, if only in the fact that it is certainly obtained from very old wild trees, whereas the cassia of commerce is obtained from cultivated trees only (Ford).

I found the six samples I worked on and which I have sent to Mr. Holmes for further investigation, to differ from cassia in appearance, taste and smell, and to contain little or no mucilage. On the other hand the iodine test gave a similar reaction to cassia. Owing to the costly nature of the bark, I was able to experiment only on very small quantities.

The Chinese call their cinnamon bark by different names and pay more in some cases for an ounce of "cinnamon" than a picul (133⅓ lbs.) of cassia.

A cold aqueous infusion of all six samples yielded with iodine a bluish-black coloration, but with $HgCl_2$ there was no evidence of the presence of mucilage. The aroma of all six came near that of Ceylon cinnamon, but in some cases there was a pungency more consistent with the idea of their being derived from cassia.

One important point, however, I have been able to ascertain is, that "Chinese cinnamon" grows wild in Annam much further south than the West River in the Kwangsi and Kwangtung provinces, where cassia is cultivated.

The Chinese adopt the common name of Kwei for both cinnamon and cassia, but distinguish the two by an additional name; for instance, ordinary cinnamon is Jan Kwei and ordinary cassia Kwei pi.

Chinese cinnamon is never exported, owing to the heavy prices the Chinese pay for it. There are a good many varieties, all of which grow wild in Annam, in the neighborhood of a mountain there, called Ching Fa. The most expensive kinds come from the mountain itself, and are obtained from trees one or two hundred years old. It is said that trees of this age emit a fragrance. The size of one of these trees is from twenty to fifty feet high, and four to five feet in circumference. Annamites, who go in search of these trees, usually carry provisions to last for two months. Owing to the enormous price the Chinese pay the trees are denuded of their bark and consequently die.

Ching Fa Kwei, so-called because it comes from the Ching Fa Mountain, is the best kind, and its cost is about twenty-five dollars an ounce. Chinese doctors say this kind of cinnamon is good for curing and purging disease of the lungs and kidneys, inflammation of the eyes, convulsions in children, toothache, etc. When a piece has actually cured a dangerous disease, it is called Shan Kwei or God's cinnamon, and is held to be invaluable by the Chinese, and if procurable costs from fifty to one hundred times its weight in silver.

Foo Kwei (bitter cinnamon) and *Ye Kwei* (wild cinnamon) are also obtained from the same mountain. An infusion of the former is colorless and bitter, while that of the latter gives a sweet taste and imparts a dark red color to the water.

All the above kinds are very scarce.

Ngoi Ho Kwei.—A very good kind obtained from hills close by the above-named mountain. It is readily procurable at Chinese druggists' shops, and costs from five to seven dollars an ounce. Chinese doctors generally prescribe this kind for sickness.

Ko Shan Kwei.—This is an inferior kind of cinnamon, and is an article of trade; cost fifty cents to three dollars a catty.

All the samples sent to Mr. Holmes are strongest in flavor in the liber or endophlœum.

The liber of this drug in fact agrees with Ceylon cinnamon.

The remarks already made on the subject by various authors may be here summarized.

Wells Williams, in his Chinese Commercial Guide, under the head of "Chinese Imports," gives the following:

Cinnamon (Jan K'wei). "A little is imported into the northern provinces where none of the cinnamon or cassia trees grow. Cochin China produces both these plants, and the true cinnamon has long been sent thence to China both by vessels and travelling traders across the frontier."

Stillé and Maisch (page 476), "A kind of Chinese or Saigon cinnamon of late occasionally met with is in more regular unscraped quills, yields a darker colored powder (than cassia), but has a very sweet and warm cinnamon taste. Its histological structure is very similar to Ceylon cinnamon."

"Pharmacographia" (pages 528–30), "China cinnamon of 1870 comes still nearer to Ceylon cinnamon, except that it is coated. A

transverse section of a quill not thicker than one millimetre exhibits the three layers described as characterizing that bark. The schlerenchymatous ring is covered by a parenchyma rich in oil ducts, so that it is obvious that the flavor of the drug could not be improved by scraping."

The expedition of Lieut. Garnier for the exploration of Cochin China found cassia (?) growing wild in about north latitude 19°. Dr. Thorel also states that it grows in a wild state in the forests of Cochin China. Ford in his West River expedition, 1882, says *C. Cassia* was not met with anywhere in a wild state, nor could any native be found who knew where it did grow wild.

Dumoutier's "Essai sur la Pharmacie Annamite" mentions both the bark of cinnamon and cassia.

BARK OF XANTHOXYLON SENEGALENSE (ARTAR ROOT).[1]

By P. Giacosa and M. Soave.

After a description of the known species of *Xanthoxylon* and of the literature of the subject, the following results are given of the examination of artar root, which presumably belongs to *X. Senegalense*, D. C.

The root is generally cylindrical, somewhat contorted, and covered with bark, the underlying wood is pale yellow with minute white spots, the annual rings are barely visible, the medullary rays are very fine and waving, and meet at the centre, where, however, there is no pith; the wood is very close, tough, hard and heavy, and has neither taste nor smell. The bark is covered with waving, longitudinal furrows; in color it is reddish-brown, with bright, yellow spots, or yellow with grayish patches; it has a peculiar aromatic odor, and a taste which is aromatic at first, then burning, and causes itching of the tongue.

The authors have previously mentioned (1888) the occurrence in a specimen of this bark of a fixed oil, of a neutral, crystalline substance melting at about 120°, and of two alkaloids, the more abundant of which is amorphous; the other, which occurs only in small quantity, crystallizes in large, blood-red needles soluble in hot water.

[1] *Gazzetta*, 19, 303–333. Reprinted from *Jour. Chem. Soc.*, August, 1890, p. 918.

To isolate the alkaloids from fresh specimens of the bark, they are powdered, extracted with 94 per cent. alcohol, the extract condensed by distillation and evaporation to a syrupy consistency, made alkaline with soda, and extracted with ether; on treating the washed and concentrated ethereal solution with hydrochloric acid, it yields an abundant deposit of minute needles soluble in cold water. On the addition of ammonia or soda to the cold, aqueous solution of this hydrochloride, the base is precipitated as a light, amorphous, reddish yellow, flocculent powder, the hot aqueous solution of which on evaporation does not yield the alkaloid previously mentioned as crystallizing in red needles. It would therefore appear that the latter is not a constant constituent of the bark. On purifying the alkaloid by repeatedly combining it with hydrochloric acid, recrystallizing, and decomposing the salt, the first portions of the hydrochloride which separate were found to be more insoluble than the succeeding portions. On collecting the former apart and treating them with alkalies, a perfectly white base is obtained. This appears to be crystallizable, and dissolves in acids forming pale-yellow salts; the *hydrochloride* dissolves with difficulty in water and alcohol, and crystallizes out in pale, yellowish needles which, on heating at 200° darken, and melt at 270°.

Artarine is the principal alkaloid in the bark of artar root, of which it forms 0·4 per cent. It is an amorphous, uncrystallizable, rose-gray powder, which darkens a little on exposure to light; it turns brown on heating at 210°, and melts with decomposition at 240°; when heated on platinum foil, it melts, decomposes, gives off white fumes having an odor of quinoline, chars, and is finally burnt away with difficulty, but without leaving any ash. It shows an alkaline reaction to damp reddened litmus paper, and is converted by acids into golden yellow salts; it undergoes no change by prolonged keeping over sulphuric acid. It dissolves readily in ether, boiling amyl alcohol, and warm acetone, and also, when freshly precipitated, in warm methyl alcohol, only with difficulty in warm chloroform, and not at all in water or benzin. It is sparingly soluble in boiling 98 per cent. alcohol. The *hydrochloride*, $C_{21}H_{23}NO_4$ HCl, may be purified by precipitating its alcoholic solution with an excess of ether. It crystallizes in large, slender needles, occasionally forming tufts or nodules; it is blackened on heating to 60—70°, and melts at 189° with decomposition. It is freely soluble

in methyl alcohol and in acetone, readily in warm chloroform and in amyl alcohol, moderately in warm alcohol, less so in warm water (0·514 per cent. at 14° C.), but is altogether insoluble in ether and in benzin. The presence of free acid considerably diminishes the solubility of the hydrochloride, and of all the other artarine salts. Solutions of the hydrochloride in water or alcohol are inactive to light. There are probably three hydrates of this compound, containing 2, 3, and 4 mols. H_2O respectively; the last of these is obtained by cooling an aqueous solution saturated in the cold; it melts at 194°. The *platinochloride* crystallizes in slender pale yellow needles which do not melt at 290°, and are insoluble in water and alcohol. The *hydriodide* is obtained by the action of potassium iodide on the hydrochloride; it crystallizes in very slender, interlaced, yellow needles which dissolve freely in warm water and alcohol.

Another iodine-derivative, $C_{21}H_{23}NO_4HI_3$, is obtained by treating the cold alcoholic solution of artarine with a solution of iodine in potassium iodide; it forms aggregates of greenish-brown, microscopic needles which are insoluble in water, and only dissolve with difficulty in boiling absolute alcohol. The *sulphate* is a white powder consisting of microscopic needles; it darkens on heating to 60–70°, and melts at 240°. The *nitrate*, obtained by adding potassium nitrate to an aqueous solution of the hydrochloride, is a thick, gelatinous, yellow mass containing a few microscopic crystals. It crystallizes from alcohol in thin plates, a little longer and thinner than those of uric acid, and melts at 212°. The *phosphate* and *arsenate* crystallize in dirty yellow aggregates of microscopic prisms, which are only very sparingly soluble in water; the *chromate* forms very long reddish-yellow needles grouped in tufts; the *hydrobromide*, *molybdate*, *benzoate*, and *salicylate* are yellow, semi-crystalline powders; the *oxalate* and *tartrate* occur in hemispherical aggregates of needles; the *picrate* forms dendritic groups of very bright yellow needles.

The analyses of the compounds of artarine agree equally well with the formulæ $C_{21}H_{23}NO_4$ and $C_{20}H_{17}NO_4$ (berberine); other points of resemblance and distinction between artarine and berberine are as follows:—

Artarine forms yellow salts, the solubility of which is diminished by the presence of acids; it also forms a periodide, and generally

resembles berberine in its reactions. It differs from berberine in being colorless, uncrystallizable, and in the solubility, melting points, and crystalline character of its salts. It also dissolves in sulphuric acid without any discoloration, and is colored blood-red by the action of potassium nitrate and concentrated sulphuric acid. The hydrochloride acquires by the action of chlorine water at most a yellowish tinge which is dissipated on addition of ammonia. The double iodides of potassium and mercury or cadmium give yellowish, flocculent precipitates, and the iodide of potassium and bismuth gives a similar red precipitate, all of which are insoluble in excess of the reagent; phosphantimonic acid only occasions a slight turbidity which disappears in excess. If the formula $C_{21}H_{23}NO_4$ is adopted for artarine, its constitution is probably that of a methylhydroberberine.

The red alkaloid, previously obtained from a specimen of the bark, crystallizes in blood-red needles readily soluble in water, and forms yellow salts when heated with acids; the *hydrochloride* melts at 170°, the *sulphate* at 265°, and the *platinochloride* at 290°. Besides these alkaloids, the authors previously isolated from the light petroleum extract of the bark a neutral, crystalline substance which is either identical with cubebin ($C_{10}H_{10}O_3$) or has the formula $C_{14}H_{14}O_4$. This substance crystallizes in transparent, colorless prisms which melt at 123°, and dissolve readily in warm ether, chloroform, alcohol, and light petroleum, but are insoluble in water. Like cubebin, it is colored dark-red by concentrated sulphuric acid; on the other hand neither acetic nor pyrocatechuic acid was detected among the products of its fusion with potash. It is first colored wine-red by concentrated sulphuric acid and then dissolved; in the presence of potassium chromate, it acquires a dull violet color; it is not affected by potash or ammonia, even on heating. A mixture of sulphuric acid (4 vols.) and water (1 vol.) colors the crystals red and partially dissolves them in the cold; on gently warming, the liquid becomes violet, and the crystals are charred. If sulphuric acid is added to the chloroform solution of the substance, an intense purple red coloration is produced at the points of junction of the two liquids.

A neutral nitrogenous substance of unknown composition has also been isolated; it forms pale-yellow crystals melting at 170°, and its alcoholic solution is colored bright-green by ferric chloride.

SWEET PELLITORY.[1]

By David Hooper.

A Persian drug is annually imported into Bombay in the Spring under the names of *Bozidan* (Persian) and *Mitha-akkalkara* (*Bombay*). Bozidan is also applied to *Caucalis orientalis*, the βουσαιδαν of the later Greek physicians, and *Mitha-akkalkara* signifies "sweet pellitory," *akkalkara* being the Indian term for the root of pellitory of Spain as sold in the bazaars. Dr. Dymock has a notice of this drug in the appendix to his "Materia Medica of Western India," and it is doubtfully referred to a species of pyrethrum in Sakharam Arjun's "Catalogue of Bombay Drugs." Dr. Dymock has been able to examine some freshly imported parcels of the root, and from some specimens of the flowers and fruit, he has identified the plant to be *Tanacetum umbelliferum*, Boissier. The native doctors consider it to be aphrodisiac, tonic, deobstruent, useful in rheumatism and gout, and in enlargement of the liver and spleen. They also regard it as having abortifacient and anthelmintic properties.

The root has some resemblance to pellitory, but it is larger and lighter in color. It is rough and furrowed longitudinally; internally it is hard and whitish, and breaks with a tough, close fracture. The microscopic structure also resembles that of pellitory root. The corky layer is made up of thick-walled cells and oil cells occur in the middle layer of the bark and in the medullary rays. Some of the parenchymatous cells were loaded with granular matter which, however, did not show the sphæroidal character of inulin when the root had been immersed for four months in alcohol. The root was sweetish and mawkish to the taste, with a very slight degree of acridity, and the odor was like chaulmoogra oil, especially when powdered or boiled with water. A proximate analysis of the powdered root separated ether extract 1·0, alcoholic extract 8·6, water extract 25·1, crude fibre 56·9, and 6·8 of ash in 100 parts. The ether extract, having the peculiar odor of the drug, was evaporated to dryness and digested in rectified spirits for several months; this separated a whitish insoluble granular fatty substance, and a light reddish brown liquid. The insoluble portion examined under a microscope was seen to consist of radiating crystalline tufts of wax, tasteless, and neutral in reaction. It dissolved in petroleum

[1] *Phar. Jour. and Trans.*, Aug. 23, 1890, p. 143.

ether, and to some extent in boiling alcohol, solidifying in the cold. It softened a little above 70° C., at the temperature of boiling water melted to a brown liquid, and with sufficient heat it burnt away on platinum foil with a smoky flame. The soluble portion of the ether extract was evaporated; the residue was acid in reaction, and produced a numbing sensation on the tongue, and at the same time caused a copious flow of saliva. This fatty residue was treated with petroleum ether, which dissolved some fatty acid, crystalline and fragrant, and left a brown resin. The resin had the properties of pyrethrin. Besides its action on the tongue, it was soluble in proof spirit, ether, chloroform and bisulphide of carbon; insoluble in ammonia, caustic and carbonated alkalies, and but slightly soluble in cold petroleum ether. It dissolved in nitric acid with evolution of gas, and in sulphuric acid with a reddish brown color and evolving the odor of butyric acid.

The alcoholic extract contained an organic acid in addition to some saccharine matter reducing Fehling's solution, and no traces of an alkaloid. The organic acid was darkened in color with ferric salts, gave an orange precipitate with plumbic acetate, and caused no deposit in gelatin solution. The water extract contained 15 per cent. of a carbohydrate precipitated in a pulverulent form with three volumes of alcohol.

Pellitory root contains 5 per cent. of pyrethrin,[1] with certain oily and fatty matters, about half its weight of inulin, and a small quantity of tannin (?). The sweet pellitory contains a minute proportion of pyrethrin (the entire ether extract amounting to only one per cent.), with fat and wax, an organic acid possessing pigmental properties, glucose and inulin. The sweet pellitory is so named not so much, I should consider, from the amount of sugar it contains as from the small amount of the acrid and pungent principle.

THE PREPARATION OF ALOES IN CURACAO.[2]

The curacao aloes of commerce is produced principally in the three islands of Curacao, Aruba and Bonaire, Dutch possessions in the Caribbean Sea north of the coast of Venezuela. The majority of the plants belong to the species Aloe vulgaris, although it is probable that occasionally the A. spicata is also met with; but, even if

[1] C. J. S. Thompson, *Pharm. Journ.*, [3], xvii, 567.

[2] From the *Chemist and Druggist.*

that is so, no distinction is made between the two plants by the juice manufacturers, and both are boiled down together. In 1885 a few young plants of the East Indian Aloe Socotrina, which yields a juice of much higher commercial value than A. vulgaris, were purchased from one of the German botanical gardens through the intervention of Professor Suringar, a well-known Dutch scientist, and forwarded to Aruba with a view of acclimatizing the Socotrine variety there; but the experiment failed completely, as most of the plants perished during the voyage, and the residue met a similar fate shortly after its arrival. It is not improbable, however, that fresh efforts will be made in course of time to improve the species, and this is an absolute necessity if the industry is to be maintained, for at present the market value of the common Curacao aloes juice has fallen to such a point that in many cases the proceeds is not sufficient to pay the wages of the laborers who cut the plant. Mr. Holmes is of opinion that Aloes Perryi would be the most suitable species to employ for the improvement of the Curacao aloes. The principal commercial use of Curacao aloes was in dyeing, especially in the preparation of Bismarck brown. That color, however, is by no means so much in demand now as it used to be, and as in medicine Curacao aloes is used only for veterinary purposes, the demand has naturally ceased to keep pace with the supply.

There is scarcely a culture which requires less trouble and skill than the propagation of Curacao aloes. The soil need only be cleared of trees and shrubs to be ready for planting. Manuring is unnecessary, and there is no need of fencing the plantation, as the only animals from which the young plants have anything to fear are pigs, which are apt to dig up the roots. The plants are set out in rows, between which a space of about two feet is left open. They grow everywhere, even in the most rocky soil, with remarkable facility. The plants yield their juice after the rainy season, and they are propagated from the young shoots, which sprout up all around the parent plant, and are sold by the thousand. It does not appear that the plants are ever propagated from seed. The flower of the aloes growing in Curacao is of a yellow color, while that of the Socotrine aloes is red. Mr. Van Koolwyk, a gentleman who lived in the Dutch West India islands for many years, gives the following account of the collection and preparation of the aloes juice: The plants are cut some time after the rains have ceased as the juice is

too thick during the dry season, and too watery immediately after the rains. The aloes plant is about 18 inches high, and its leaves spread in all directions. In the island of Bonaire the plants are cut by women, who gather the leaves at the top with one hand while with the other they give a deep circular incision at the base of the crown, thus lopping off all the larger leaves, but leaving a few young shoots to sprout afresh. In Aruba, on the other hand, where the work of cutting is done by men, the entire crown is cut away. In various parts of the aloes field, within easy reach of the cutters, are placed wooden troughs. The cut leaves are placed perpendicular in the trough, and a small tin receptacle is put at the opening. The tins used for this purpose are generally empty butter or lard tins—those commodities being imported in the West India islands from the States. A brown colored juice flows abundantly from the leaves without any further manipulation, and the tin, when full, is emptied out into a wooden cask. The dry leaves are thrown away or used as cattle food.

In some of the aloes fields there is a brick-built furnace provided with a large copper boiler, into which the contents of the cask are emptied and boiled over an open fire under constant stirring. While still hot the boiled juice is poured into the wooden cases, in which it is shipped to the States and Europe. Aloes boiling is perceptible at a long distance by the peculiar odor given off by the juice, an odor which is popularly reputed to be very conducive to health. In many cases the field possesses no furnace, and the juice has to be carted to a common boiling place. One of the largest of these works is situated in the neighborhood of Oranjestad, the capital of Aruba. Here the operation is done by steam, and not over an open fire, as in the fields. The proprietor of these works makes a certain charge for boiling, and occasionally he purchases the raw juice on his own account, and leaves it unboiled until a large supply has accumulated. While the aloes market was yet in a more satisfactory condition carts were sent out from the works to collect the juice in the fields; but that is not done now. The method of making incisions in the leaf and evaporating the juice in the sun, described in certain hand-books, is never followed in the Dutch Indies, as it takes much more time than that actually in use, while the quality of the juice obtained is not necessarily superior. The produce of the islands of Bonaire and Aruba is shipped to

Curacao, the principal island of the group and its trading centre. Hence the drug is only known as Curacao aloes, although the output of the island of Curacao itself is insignificant, the yield being:

	1885. Kilos.	1886. Kilos.	1887. Kilos.
In Curacao,	2,080	500	—
In Bonaire,	5,821	18,640	2,075
In Aruba,	123,115	158,011	189,925

CURACOA ALOES.[1]

By E. M. Holmes, F.L.S.

Curator of the Museum of the Pharmaceutical Society of Great Britain.

During the last month there has been presented to the Society's Museum, by D. F. van Eeden, of Haarlem, specimens of the leaves and flowers of the aloe from which Curacoa aloes is prepared.

In a previous note (*Pharm. Journ.*, [3], xx, p. 562) I pointed out the probability that this variety of aloes might perhaps owe its distinct appearance and peculiar odor to the presence in the island of some other species of aloes as well as the *A. vulgaris*. In subsequent letters, however, Professor van Eeden stated that so far as he could learn only one species of aloes is *cultivated* in the island at the present time, and he kindly promised to obtain flowering specimens of the plant for identification. These specimens arrived during the past month, the leaves being preserved in spirit and the inflorescence in vaselin, so that the color and consistence of the flowers was well retained. These specimens have been examined by Mr. J. G. Baker, F.R.S., of the Kew Herbarium, who is so well known as an authority on the genus. He refers the plant without hesitation to *Aloe chinensis*, Baker.

This species is figured and described in the *Botanical Magazine*, p. 630. The occurrence of a Chinese (?) species as a cultivated plant in the Dutch colony of Curacoa seems so unexpected an occurrence that it seems desirable to quote from Mr. Baker's description of the plant in the *Botanical Magazine*.

"Native country unknown. Trusting to a large extent to garden tradition we venture to identify the present plant with an aloe which was introduced from China by Mr. W. Anderson in 1817, and which was briefly described by Haworth from flowerless specimens in his

[1] From the *Pharmaceutical Journal and Transactions*, Sept. 13, 1890, p. 205.

'Suppl. Plant. Succul.,' p. 45, in 1819, as a probable var. of *Aloe barbadensis*, and is mentioned by name only in Salm-Dyck's monograph or in Kunth's 'Enum.,' iv, 522. It is clearly quite specifically distinct from *A. barbadensis*. The leaves are never more than half the length of those in that species and are spotted more or less copiously on the back and face after the fashion of *Aloe abyssinica;* the raceme is very much laxer and the stamens are very much shorter. We have had it for a long time in the Kew collection, but never, so far as I know, with any definite information as to its native country. The flower has a strong and decidedly unpleasant scent. Its affinity is with *A. barbadensis*, *abyssinica* and *consobrina*."

A full description of the plant is given both in the *Botanical Magazine* and in Mr. Baker's paper on "Aloinæ" in the *Journal of the Linnean Society*, vol. xviii (1881. p. 161). In this paper the name *Aloe barbadensis*, Mill., is sunk under that of *A. vera*, L.

From the above statements it would appear that the Curacoa aloe plant is nearly allied but yet specifically distinct from *A. vera*, L. (*A. barbadensis*, Mill.), so that if it can be shown that the plant cultivated in Barbadoes is the true *Aloe barbadensis*, Mill., the specific difference might go far towards explaining the characteristic odor and appearance of Curacoa aloes as compared with the Bardadoes aloes of commerce.

A. vera, L. (*Aloe barbadensis*, Mill.), is a native of the Mediterranean region, although now widely disseminated in the warmer regions of the globe, and there is a variety of it, *littoralis*, Kœnig, found on the southern shores of eastern India, which is stated in Baker's monograph (*Journ. Lin. Soc.*, xvliii, p. 176) to come near to *A. chinensis*, Baker.

In the absence of more definite information, therefore, it may be assumed that the *Aloe chinensis* cultivated in Curacoa was probably carried there from the Dutch East Indies; although Ligon, "History of Barbadoes," London, 1673, p. 98, speaks of the plant as if it were indigenous in A.D. 1647–1650, about twenty years only after the arrival of the first settlers.[2]

On the other hand no aloe is known as a native of America.

The two specimens received from Professor van Eeden differ slightly from the description given of *A. chinensis*, Baker, in the following particulars:

[2] *Pharmacographia*, 2d ed., p. 681.

The leaves have a purplish color (due to the action of the spirit employed to preserve them?). The anthers (but not the filaments) are exserted. Each of the segments of the perianth have three purplish lines extending from base to apex. The three outer segments are somewhat acute, and the inner distinctly obtuse. The color of the leaves and the apex of the perianth segments are not, however, alluded to in Mr. Baker's description.

The aloes of the Arabian coast imperfectly described by Forskäl in 1775 have apparently never been refound, and the distribution of those on the east coast of Africa is not accurately known, so that if due allowance be made for the changes that are apt to take place in the position of labels in even the best regulated gardens, *A. chinensis* may quite possibly be found to be a native of the coast of Africa, Arabia or India.

Probably several species afford the aloes which find their way to Bombay and Aden,[3] and varieties of a species nearly allied to *A. vera* are probably used for this purpose. This opportunity may therefore be taken to express the hope that Indian botanists will endeavor to clear up the mystery which still surrounds the botanical source of the aloes produced on the shores of N.E. Africa, Arabia and India. At the present time there is an aloe entering British commerce under the name of *Socotrine* aloes, and apparently imported from Zanzibar, which has an odor resembling that of Barbadoes aloes, and like it gives a crimson color with nitric acid, but of the geographical and botanical source of which nothing is accurately known.

The species already described in Baker's monograph as occurring in the regions above mentioned are: *A. Schimperi*, Todaro, p. 159, *A. macrocarpa*, Todaro, *A. commutata*, Todaro, *A. Abyssinica*, Lam., all from Abyssinia; *A. crassipes*, Baker, between Suakin and Berber; *A. constricta*, Baker, S.E. Tropical Africa, and *A. tenuifolia*, Lam., near Zanzibar. But, with the exception of *A. Abyssinica*, I am not aware that any of these species have been stated to yield commercial aloes.

An ointment for chapped hands is recommended in *Provincial Med. Jour.*, consisting of menthol 15 gr., salol 30 gr., olive oil ½ drachm, and lanolin 1½ oz. It is said to alleviate the pain on the first application.

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[3] *Pharm. Journ.*, [3], xi, p. 733, "Jaferabad Aloes," *ibid.*, p. 121, "Musambra Aloes."

ACTION OF SULPHURIC AND NITRIC ACIDS ON ALUMINIUM.[1]

By A. Ditte.

When aluminium foil is placed in sulphuric acid of 2·5 per cent., it at first seems to undergo no change, but after a time the surface loses its polish and becomes matt, and bubbles of gas appear and increase in quantity as the surface becomes rougher. Eventually the aluminium dissolves completely. In a vacuum, the phenomena are similar, but follow one another more rapidly, the air condensed on the surface being given off first, followed as soon as the pressure is low by the hydrogen liberated by the action of the acid. Like amalgamated zinc, the aluminium is attacked immediately on its immersion in the acid, but the surface becomes covered with a film of hydrogen, which prevents further action.

If the sulphuric acid is mixed with a small quantity of any chloride with a heat of formation greater than that of aluminium chloride (platinum, gold, copper, mercury), the evolution of hydrogen is much more rapid. The chlorides of iron, zinc, etc., have no such effect.

In presence of traces of the active chlorides, the evolution of hydrogen is at first rapid, but after a time it slackens, and a white deposit of basic aluminium sulphate, $2Al_2O_3,SO_3$, is formed, and increases in quantity until the whole of the aluminium has been dissolved.

Aluminium, under atmospheric pressure is not attacked by a solution of aluminium sulphate, but in a vacuum, air is first disengaged from the surface of the metal, and the latter is then converted into the basic sulphate with evolution of hydrogen. The same change takes place readily even under atmospheric pressure if a trace of one of the active chlorides is added.

The displacement of copper from copper sulphate by aluminium is an exothermic change, but does not take place under ordinary conditions even in presence of free acid. After prolonged contact, the aluminium is slowly attacked, the rapidity of the reaction increasing as the surface of the metal becomes roughened. In presence of a trace of one of the active chlorides, the deposition of copper is much more rapid, even in absence of free sulphuric acid.

[1] *Compt. rend.*, 110, 573 and 782. Reprinted from *Jour. Chem. Soc.*, July, 1890, p. 701.

The same explanation holds in all cases where the aluminium does not readily enter into a reaction which would be exothermic. The surface of the metal becomes covered with a thin layer of gas, which prevents further change, but which can be removed by reduction of pressure or by the roughening of the surface of the aluminium in consequence of the deposition of another metal upon it.

The action of nitric acid and nitrates on aluminium, like the action of sulphuric acid and sulphates, is impeded by the formation of a film of gas on the surface of the metal. If the action takes place in a vacuum, or if the liquids are heated, dissolution of the metal takes place much more rapidly. Very dilute nitric acid yields nitrogen, nitric oxide and ammonia. Nitirc acid of 3 per cent., mixed with a small quantity of platinum chloride, dissolves aluminium with very slight evolution of gas and formation of considerable quantities of ammonium nitrate. Aluminium dissolves in a solution of the normal nitrate, especially on heating, with evolution of hydrogen and formation of the basic nitrate $2Al_2O_3,N_2O_5,10H_2O$. At the ordinary temperature, dissolution takes place very slowly, but the action is somewhat more rapid in a vacuum. The decomposition of water by aluminium would result in the formation of the hydroxide and hydrogen, either of which can form a protecting film on the surface of the metal. In presence of any salt which will dissolve the aluminium hydroxide, the metal is gradually attacked. Salts which do not dissolve alumina have no influence on the change.

MONOCALCIUM PHOSPHATE.[1]

By I. Stoklasa.

Monocalcium phosphate, $CaH_4(PO_4)_2 + H_2O$, was prepared by dissolving pure dicalcium phosphate in 31 per cent. phosphoric acid, and recrystallizing. It was then washed with absolute alcohol and ether, and dried. Washing with ether only (Erlenmeyer, Birnbaum, Wattenberg) never removes the free phosphoric acid completely, so that if prepared in this way it may contain several per cent. of free phosphoric acid. The presence of the latter may be proved, either by treatment with absolute alcohol, or by dissolving the salt completely in water and estimating volumetrically with deci-

[1] *Listy Chem.*, 13, pp. 203, 240, 273. Reprinted from *Jour. Chem. Soc.*, July, 1890, p. 695.

normal potash in the presence of methyl-orange. Alcohol containing only small quantities of water decomposes monocalcium phosphate. The author finds that even the purest preparations decompose in closed vessels spontaneously, so that about 0·05 of free acid is formed in a month.

Monocalcium phosphate is not hygroscopic, as usually stated, especially by Birnbaum and Packard. It attracts some moisture in an atmosphere saturated with aqueous vapor, but loses it again in dry air. The hygroscopic nature of the preparation observed by the authors quoted above is, as the author shows, due to the presence of free phosphoric acid, of which at least 0·2 per cent. must have been present in Birnbaum's specimen. Steam at 80° decomposes monocalcium phosphate. With regard to the very discrepant statements as to the decomposition of monocalcium phosphate by cold water, the author has treated pure preparations with varying quantities of water, and gives his results in a tabular form; the decomposition being represented by the general formula $a CaH_4(PO_4)_2,H_2O + H_2O = (a - 1)CaH_4(PO_4)_2,H_2O + CaHPO_4 + 2H_2O + H_3PO_4$. For example, for 1 part of salt and 1 part of water $a = 4$, and, therefore, the quantity of undecomposed salt going into the aqueous solution $(a - 1) = 3$, 26 per cent. of the salt being decomposed in the above manner. With increase in the quantity of water, more salt goes into solution, and when 1 part of salt is treated with 200 parts of water, the decomposition is very small, whereas the solution is complete; here $a = 1024$, and from this only 1 part is decomposed = 0·1 per cent. The decomposition is regular, for, whereas, for the proportion of 1 salt : 1 water, the quantity of free phosphoric acid formed = 7·51, for 1 salt : 25 water, that quantity becomes one-half this = 3·75, and for every increase of 25 parts of water again one-half of the previous amount. The salt dissolves in 200 parts of water to a clear solution, and at this point it becomes impossible to prove the existence of the free acid, which would indicate decomposition. Above this limit the monocalcium phosphate is re-formed from its products of decomposition—dicalcium phosphate and phosphoric acid.[1]

Free phosphoric acid, added to monocalcium phosphate solutions, prevents their decomposition. If we add to monocalcium phos-

[1] Probably a state of unstable equilibrium sets in between these three substances, if Mendeléeff's theory of solution is correct.—B. B.

phate such a quantity of free phosphoric acid as would be formed by the decomposition of the salt, no decomposition takes place; for example, for 1 salt : 1 water, this quantity will be 7·5 per cent., as seen from the result stated above. If Erlenmeyer finds the solubility of the salt 1 : 100, it follows that the presence of 0·4 per cent. of free phosphoric acid in his salt had prevented the decomposition and increased the solubility.

The author's conclusions as regards the solubility of superphosphates and disuperphosphates in water, are of technical interest.

FREEZING OF COLLOÏDAL SOLUTIONS.[1]

By N. Lubavin.

The investigations of Pfaff, Geiger and Payen on the freezing of colloïdal solutions have been overlooked by subsequent investigators of colloïdal solutions, especially Graham and Van Bemmelen. The author finds that from some of such solutions the substance dissolved is completely or partly separated after freezing, whereas in the case of others the precipitate again passes into solution. A solution of colloïdal silicic acid, obtained by mixing soluble glass with hydrochloric acid in aqueous solution, was divided into two parts, one of which was exposed to a temperature of 7–10° for two days after which it was exposed to the temperature of the laboratory (+ 15°) for two days. From the frozen solution as much as 96·96 per cent. of the silica was separated by filtration, whereas the original unfrozen solution yielded only 0·72 per cent. of insoluble silicic acid. This is not in contradiction with Graham's statement, that the stability of a colloïdal solution of silicic acid increases with decreasing temperature, for, according to Graham, more concentrated solutions are more easily coagulated. Indeed, on freezing, gradual concentration takes place, owing to the separation of ice, so that the coagulation is accelerated. A colloïdal solution of antimony trisulphide was prepared by Schulze's method, namely, saturating a solution of one part of tartar-emetic in 200 parts of water with hydrogen sulphide. Nothing separated from the original solution, even when it was allowed to remain for months at the ordinary temperature; whereas from the same solution, after exposure to a temperature of — 6° for 29 hours and

[1] *J. Russ. Chem. Soc.*, **21**, 397–406. Reprinted from *Jour. Chem. Soc.*, July, 1890, p. 685.

subsequent thawing of the ice, complete separation of the antimony sulphide took place. When a very large quantity of the same solution was exposed to a low temperature, the separation was not quite complete. A colloïdal solution of copper sulphide was obtained by the action of hydrogen sulphide on copper glycollate. The separation of the sulphide was incomplete, although the solution was kept one day at — 6° and one day at — 19°. Nothing separated out at the ordinary temperature. Colloïdal solutions of ferric hydroxide, obtained by the dialysis of different preparations of basic chloride, sometimes remain uncoagulated by freezing, sometimes are partly coagulated. This depends on the purity of such solutions, and partly, perhaps on the rate of cooling. Solutions of potassium ferric tartrate behaved in a similar manner. One part of starch was dissolved in 100 parts of boiling water, and the solution was kept at a temperature below zero; flocks separated, as shown already by Payen, but the separation was incomplete. It was found that starch solutions which had been subjected to freezing are much more easily and quickly filtered than the same solutions not frozen, so that this process might be used for the better filtration of slimy liquids and precipitates. Neither white of egg nor milk is coagulated, even on freezing at — 15° to — 20°. The fact that peat falls to pieces after being frozen is explained by the author on assumption that it contains colloïdal substances, which are coagulated by freezing.

THE EFFECT OF FREEZING UPON IMPURITIES CONTAINED IN WATER.

The Massachusetts State Board of Health (June, 1890,) publish experiments with seventy-six samples of water, and 336 samples of ice from fifty-eight localities to answer the above question.

In ice from polluted sources compared with water from the same, the experiments showed:

(1) That in the ice the color and salt had been removed.

(2) That all but 13 per cent. of the other impurities of the water, as shown by chemical analysis, had been removed.

(3) The number of bacteria in the cubic centimetre were: For *snow* (one sample), 1,246; for *clear* ice (part of the same cake as above), 6; for clear ice from an unpolluted source, 0.

(4) The average of 12 samples from most polluted sources, 138

The number of bacteria varied much in different parts of the same cake.

From the examinations which have been made, it appears probable that when ice forms in the surface of a pond or river a considerable part of the impurity in the water near the surface is entangled in the first inch or less in depth, and that the ice which forms below this first inch contains but a very small percentage of the impurities of the water. If snow falls upon the thin ice, causing it to sink so that the water from below saturates the snow, it will freeze without purification; or if rain falls upon the snow and freezes, the ice thus formed contains the impurities of the snow and of the rain water and of whatever else may have settled out of the air. The method often pursued, of flooding the ice of a pond or river, by cutting holes through it, gives a layer of ice as impure as the water of which it is formed.

The purifying effect of freezing is greater upon substances in solution than upon those in suspension. This is confirmed by the fact that a large part of the organic matter, one-half or three-quarters, and sometimes more, that is found in good ice is of particles in suspension, and is readily removed by filter paper.

From the average of all the water and ice used for ice supplies, which they have examined, they find: The organic impurities of snow ice (the sum of the ammonias) = 69 per cent. of the impurities of the water. The organic impurities of all the ice (except snow ice) = 12 per cent. of the impurities of the water. The organic impurities of clear ice = 6 per cent. of the impurities of the water. The *color* of waters was removed by freezing. The *salt* of the waters was nearly removed by freezing.

Of bacteria there were: 81 per cent. as many in *snow ice* as in the waters; 10 per cent. as many in *all other ice* as in the waters; 2 per cent. as many in *clear ice* as in the waters.

The results obtained lead to the conclusions: That while clear ice from polluted sources may contain so small a percentage of the impurities of the source that it may not be regarded as injurious to the health, the snow ice, and any other, however clear, which may have been obtained by flooding, is likely to contain so large a percentage of the impurities of the source, and, with these impurities, some of the disease germs which may be in the source, that the Board feels bound to warn the public against using ice for domestic

purposes that is obtained from a source polluted by sewage, beyond that which would be allowable in a drinking water, stream or pond, and that in general it is much safer to use for drinking water and for placing in contact with food that portion of the ice that is clear. —*Public Health.*

BRITISH PHARMACEUTICAL CONFERENCE.[1]

On Monday evening, September 1, the proceedings of the British Pharmaceutical Conference, at Leeds, commenced with a very numerously attended reception, held by the President, supported by other officers of the Conference in the Philosophical Hall, Park Row. After a short interval, during which the greetings of friends and new introductions were interspersed by inspections of the many interesting objects in the Museum of the Institute, supplemented by special exhibits of microscopes and electric apparatus, most of the company adjourned to the Lecture Theatre. There an entertainment consisting of some capitally executed songs and recitations had been provided, and this was followed by a lantern display of some very artistic views of the Wharfedale and other districts. The gathering was a most successful one, and the arrangements made were fully appreciated by the company.

The next morning, a few minutes after ten, the chair was taken in the theatre of the Philosophical Hall by the President, Mr. Charles Umney, and Mr. Richard Reynolds, in a few well-chosen words, tendered the Conference a hearty Yorkshire welcome to Leeds. A list of the delegates deputed by various associations to represent them at the sittings of the Conference was read, and after reference had been made to letters of apology that had been received from Professor Bentley, Professor Attfield and others, the ground was left clear for the regular business.

The President then called upon the senior Honorary Secretary, Mr. W. A. H. Naylor, to read the report of the Executive Committee. This document commenced with an expression of satisfaction at the maintenance of the prestige of the Conference and its continued prosperity. It may be remarked, however, that neither on this occasion, nor on several previous ones, has the Committee presented any statistics to show the numerical relations of the membership to this prosperity, and these are hardly revealed by an examination of the Financial Statement. The first event referred to in the report was the resignation by Dr. J. C. Thresh, in November last, of the office of Honorary General Secretary, the Committee recording its sense of the valuable services rendered by him during the five years he had held the office. This was followed by the statement that Mr. F. Ransom, F.C.S., had been selected to fill the vacancy. Allusion was also made to the death of Mr. Smeeton, a Vice-President, and the consequent changes. Another subject was the publication of an Addendum to the Unofficial Formulary in January, and the report also contained some words of congratulation upon the recent appointment of a committee of pharmacists to assist the Pharmacopœia Committee in preparing an Addendum to the British Pharmacopœia. As this Committee has been appointed by the Council of the Pharmaceutical Society at the instance of the Medical Council,

[1] From *The Pharmaceutical Journal and Transactions*, Sept. 6, 1890, p. 281.

it is regarded as a distinct advance towards a recognition of the claims of pharmacy to be represented in the settlement of questions relating to the Pharmacopœia. Among other items mentioned were the efforts that have been made to increase the membership and the grant of money in connection with research.

The Honorary Treasurer, Mr. W. Martindale, then read the Financial Statement for the year ending 30th June. From this it appeared that the money received during the year had amounted to £672 3*s.* 9*d.*, the principal items being £527 1*s.* 1*d.*, on account of members' subscriptions, and £135 on account of the Year-Book. The income from subscriptions, therefore, shows a slight decrease as compared with the previous year. As, however, the expenditure has also been somewhat less, the net result this year is a slightly increased balance in favor of the Association.

The President then proceeded to deliver his address, choosing for a subject Fashion in Medicine. In a few words of preliminary justification he said it could not be contended that medicine, striving year by year to become a less inexact science, knows no fashion, though it might be urged that it possessed a license for adopting fashions without parallel in any other profession, due to the rapid strides of science. The first fashion referred to was the modern disposition to replace in prescribing the remedies familiar to a former generation by new medicaments. A legion of new crystalline and resinoid principles have been adopted to the almost entire exclusion of the crude substances from which they are prepared, whilst even alkaloids have in many instances given place to synthetically prepared compounds. Certain drugs, as, for instance, opium and cinchona, are as much relied on as they were half a century ago, but they are standardized now to contain a definite amount of chemical constituent, so that the physician is enabled to use them with precision. On the other hand, some drugs, such as jalap, scammony, aloes, and gamboge, are not prescribed so frequently as formerly, and this, to some extent, has been consequent upon a want of uniformity in their quality. Another change of fashion has been in the medicaments used as external applications. Lard as a basis for ointments has been displaced by hydrocarbons or the more easily absorbed wool fat, whilst plasters are now relatively seldom ordered and the oleates of zinc, mercury and bismuth have become familiar. Concentrated percolates of the more potent drugs are also now used for external application, elegant examples of which are seen in the official liniments of aconite and belladonna and the chloroformum belladonnæ of the Unofficial Formulary. Other preparations, such as gray powder, antimonial powder, and green iodide of mercury are in less esteem than formerly, because of their want of uniformity. But although the legitimacy of most of the changes was acknowledged, the speaker could not overlook the prevailing fashion of discarding antiquated, though well-tried remedies, in favor of newly-introduced drugs, and mentioned that at the recent meeting of the British Medical Association an eminent therapeutist had denounced this rage as fatal to accuracy of observation and precision of treatment. The next fashion referred to was that of prescribing medicine in the most concentrated form, regardless of potency, and it was described as a practice not without danger to the public. But it was suggested that this has been largely brought about by the pharmacist, and it was pointed out how, ignoring

the official standards which embody the best skill and knowledge in dealing with drugs and menstrua, concentrations two or three times over and above those that can with safety be practised are now an every-day requirement. Then came the fashion of prescribing ready-made physic, which was said to be increasing to such an extent as to be positively alarming and was denounced as a delusion and a snare to those who desire to retain the art of orthodox prescribing. The last fashion in medicine particularized, was the injudicious selection by the public of medicine to be used as household remedies and the preference displayed for those covered by a medicine stamp. By this practice, the speaker said, the medical art is deprived of much opportunity, pharmacy undermined, and the public not benefited, but on the contrary greatly damaged. Some of these preparations, it was admitted, are simple in their nature, safe in the hands of the public, and not inappropriate as household remedies; but others, it was contended, are unsuited as remedies except in the hands of a medical practitioner, while many of them are of such composition that they should not be sold except under the restrictions that accompany the sale of substances included in the poisons schedule and the Pharmacy Act. In 1860 the revenue from medicine stamp duty was £43,000, whilst for the present year it has been computed at £220,000; in the same time, however, the vendors have only increased from 10,000 to 23,000, indicating that the average sales by each vendor have practically doubled. The amount paid by the public annually for stamped medicines was estimated at not far short of £1,500,000, only a portion of which, if diverted into the channels of legitimate medicine would involve great advantages to the medical profession and pharmacy. After referring to the demoralizing effect of the medicine stamp law through the facilities it affords for obtaining from a grocer or stationer supplies of opiates that would be refused by the pharmacist, the President expressed the opinion that the time has come when the medicine stamp should be abolished and when the question might be raised whether, in the interest of the public, the compounding of proprietary medicines might not be placed under restrictions similar to those which obtain on the continent. A congratulatory reference was then made to the recent appointment of a committee of pharmacists to advise the Pharmacopœia Committee of the Medical Council, and the address concluded by an appeal to pharmacists to assist in counteracting the depressing influence of the cloud that hangs over pharmacy by individually and collectively seeking to maintain and advance all matters having a scientific bearing upon this art.

At the conclusion of the address, which was listened to with close attention, and evoked repeated demonstrations of approval, Dr. Thresh proposed a vote of thanks to the President, which was carried by acclamation.

The reading of papers was then commenced with the report of the Unofficial Formulary Committee, presented by Mr. W. Martindale as its Chairman. The report simply recorded the publication at the end of last year of an Addendum to the Unofficial Formulary, and stated that the work of the Committee was at present in abeyance, pending the issue of the expected Addendum to the British Pharmacopœia.

Hyoscyamus.—In a very interesting paper Mr. Gerrard gave the results of a number of experiments extending over a period of four years and having for

their object to determine the grounds, if any, for the prevalent belief in the superiority of biennial henbane over annual. The investigation was made with specimens of both kinds of henbane grown in Middlesex, Sussex and Lincolnshire, and the parts of the plants used were the leaves and tops of the annual variety, and the first year's leaves and roots and the second year's tops of the biennial kind. From a table showing the yield of alkaloids from 1,000 parts it appeared (1) that annual henbane leaf, biennial henbane first year's leaf, and biennial second year's tops have practically the same alkaloidal value; (2) that biennial henbane first year's root contains two and a half times as much alkaloid as the leaves or tops of either variety; and (3) that the locality of growth does not influence the amount of alkaloid formed. It would seem, therefore, that the preference shown for biennial over annual henbane leaves is not well founded. Mr. Gerrard added that the biennial root yields with rectified spirit an excellent extract, comparatively free from objectionable taste and odor, which could be standardized with ease of a strength that the dose would be one-third of that of the present official extract.

Commercial Alkaline Sulphites, by Mr. C. H. Bothamley.—The author commenced by pointing out that besides the normal sulphite, represented by the normal formula M_2SO_3, and the hydrogen sulphites or bisulphites represented by the formula $MHSO_3$, a third class has recently been brought prominently forward under the name "meta-sulphites" and "meta-bisulphites." These are not, however, new products, as erroneously supposed, but were described many years ago by Muspratt, who termed them properly "anhydro-sulphites." They have the general formula $M_2S_2O_5$, and may be regarded as derived from two molecules of hydrogen sulphite with elimination of a molecule of water. Potassium bisulphite does not appear to be an article of commerce, whilst four samples supplied as sodium bisulphite contained respectively only 8·1, 34·14, 22·3 and 39 per cent. of sulphurous anhydride, the theoretical quantity in the anhydrous salt being 61·54 per cent. The difficulty in preparing these salts arises from the fact that even in solution the bisulphites pass quickly into the anhydrosulphites. The anhydrosulphites are met with in commerce in large, well-formed crystals, which at first are transparent, but soon lose some sulphurous anhydride and become quoted with a white film, after which the salt undergoes little alteration. Three samples examined gave 52·54, 56·02 and 57·42 per cent. of sulphurous anhydride, the theoretical quantity being 57·63 per cent.

Strophanthus hispidus, by Mr. E. M. Holmes.—The paper emphasized the fact that the variety of strophanthus seeds originally used by Professor Frazer, and therefore the kind from which the medicinal action described by him might be expected, came from East Africa, and differs from that yielded by the typical *S. hispidus* of West Africa. He thinks, therefore, that the commercial seeds imported from West Africa should not be employed pharmaceutically until it has been ascertained that they possess the same physiological properties as those upon which the reputation of the drug was founded. The seeds corresponding to those used by Professor Frazer were described as having a hairy surface, with the hairs pointing in one direction and appearing fawn-colored or greenish as the apex or the base of the seed is presented to the light. Mr. Holmes further mentioned that ouabain, which is said to differ

only slightly in chemical composition and therapeutic action from strophanthin is now manufactured from a smooth variety of strophanthus seeds, instead of the wood from which it was first prepared. At the conclusion of the reading of this paper a short note by Mr. T. Christy was read, accompanying two leaves of a plant grown at Sydenham from seed similar to that from which M. Arnaud has separated ouabain. In the discussion that followed, Mr. Martin bore testimony that the results upon which the reputation of the drug was founded were obtained with preparations of greenish-fawn seeds and that other kinds have not produced such satisfactory effects.

Nitrites in Potable Waters, by Dr. J. C. Thresh.—The author remarked that although a quantitative estimation of the nitrites did not seem to be of much assistance in determining the quality of a water in the present state of knowledge, probably no analyst felt he had made a complete examination of a water unless he had made at least a qualitative test for them, and if he found indications of them he justly regarded the water with suspicion. But a series of experiments Dr. Thresh has been making on the changes in composition of certain waters kept under varied conditions have led him to believe that before long the study of these changes would be of great aid in forming a judgment of the quality of a water, and especially of such as the analyst now only reports to be suspicious. One of these changes is the variation in the amount of nitrous nitrogen. In working out the subject the want of a simple and reliable quantitative test for nitrites has been much felt and eventually Dr. Thresh succeeded in making the old potassium iodide and starch test for nitrites a reliable colorimetric quantitative one for water analysis. The preparation of the reagents and the method of working were then described and Dr. Thresh concluded by giving a practical demonstration of the great delicacy of the test. In reference to Dr. Thresh's remark as to the changes that take place sometimes in a water, Mr. F. M. Rimmington said that the character of the Bradford water had undergone a great change since the last dry summer. Mr. Siebold also thought the time would come when it would be the practice to watch a water for some time before pronouncing upon its quality, and stated that on one occasion he obtained indications of the probable presence of a ptomaine in a water.

The Conference then adjourned for luncheon. Upon resuming, Mr. Naylor, in the absence of the authors, gave a *résumé* of the next two papers.

Chloroform as a Preservative, by J. F. Burnett and H. Wyatt.—Mr. Burnett gave a list of solutions made with chloroform water which he keeps for dispensing purposes, and testified to the value of chloroform in preserving infusions. Two other instances mentioned were mixtures of powdered rhubarb and aromatic powder of chalk, which he keeps rubbed down with chloroform water (1 in 8). Mr. Wyatt, among other instances, recorded the preservative action of chloroform when added to an extract of ergot mixture containing strychnine, as well as to essence of rennet and cucumber juice. The discussion that followed the reading of the papers showed a general concensus of opinion among those present as to the value of chloroform as a preservative agent, and the opinion was expressed that under medical authority it might often be advantageously used and sometimes take the place of alcohol.

Arsenic in Glycerin.—In a short note Mr. Siebold referred to the opinion

expressed at the last meeting of the Conference that glycerin might be freed from arsenical contamination by distillation, and stated that he had now found this not to be the case. But he had found that by treating glycerin, previously diluted, with recently precipitated ferric hydrate the arsenic can be completely removed, and at the same time the glycerin is freed from all sulphur compounds. The same object can be obtained by suitable treatment with potassium permanganate, but in that case redistillation of the glycerin is necessary. Mr. Lewkowitsch also referred to the same statement as to the removal of arsenic from glycerin by distillation and said it was impracticable, as the arsenious ether of glycerin is decomposed by heating to 250° C., arseniuretted hydrogen and other volatile arsenious compounds distilling over. So far as he is aware there is no process for completely freeing glycerin from arsenic on a practical scale after it has once been introduced by the use of arsenial materials in the manufacture. He pointed out that glycerin free from arsenic is obtained in those processes where the hydrolysis of fats is effected by means of water or by lime saponification, and also when sulphuric acid is used free from arsenic, as it may be prepared from the sulphur obtained by Chance's process. Out of ten samples of glycerin coming from as many different works examined for arsenic three would have had to be rejected, four contained small traces that might be disregarded, and only three were free. Concerning soap-lye glycerin a very unnecessary caution, Mr. Lewkowitsch said, had been given, because up to the present no chemically pure glycerin had been prepared from soap-lyes in consequence of the difficulties incident to the purification of it. But a sample specially prepared by himself from this material compared well with samples from other sources. In the discussion that followed the reading of the paper the question was raised as to the source of the minute quantities of iron that are sometimes observed in glycerin, and whether they might be due to a treatment like that suggested by Mr. Siebold.

Antidotes to Strychnine.—Mr. Siebold next read a short note on some experiences in reference to strychnine antidotes. The conclusions arrived at were that tannic acid is without effect, that animal charcoal might be of some use if administered very soon after the ingestion of poison, but that physiological remedies are most likely to be of service.

Caffeine and Mercuric Chloride.—Mr. R. H. Davies then read a note on a compound of caffeine and mercuric chloride which is formed as a crystalline precipitate when a solution of corrosive sublimate is added to a solution of caffeine in water. The reaction is a very delicate one, and the compound formed has a composition corresponding to that of a chloromercurate of caffeine.

Tests for Methylated Spirit, by Messrs. Campbell and Stark.—A comparative examination of the tests for methylated spirit was undertaken with a view to deciding their relative reliability and suitability for pharmaceutical testing. Emerson Reynold's test, depending upon the presence of acetone and the formation with it of aceto-mercuric compounds, was found not to be effective when less than 2 per cent. of wood spirit was added to a distillate consisting of the first 50 cc. passing over from 200 cc. of spirit. With Cazeneuve's test, depending on the reducing action of acetone and other bodies on potassium permanganate, the limits of the test were reached with the presence of 0·5 per

cent. of proof spirit. The test proposed by Riche and Bardet, depending upon the formation of methyl violet, gave results that were delicate and satisfying, the presence of 0·5 per cent. of wood spirit being satisfactorily proved, but the time and attention required are considered to render it far from being suited for the ordinary pharmacist. Miller's test, depending upon the oxidation of methyl alcohol to formic acid, was satisfactory only in mixtures containing not less than 2 per cent. of wood spirit. On the whole Cazeneuve's test was found to be the most delicate and convenient for the pharmacist, but not quite satisfactory.

This was the last paper read on Tuesday, and most of the members then made their way to the Yorkshire College, where they were received by Professor Bodington and other officials, who had made excellent arrangements to facilitate the inspection of the establishment.

On Wednesday morning the Conference reassembled at ten o'clock.

Oroxylum Indicum Bark, by Messrs. Holmes, Naylor and Chaplin.—The bark is considered in India to be an astringent and tonic, and to be useful in diarrhœa and dysentery. It has in addition been employed by Dr. Evers in cases of acute rheumatism, and is credited by him with being, when combined with opium, a much more powerful sudorific than compound powder of ipecacuanha. The plant from which the bark is derived belongs to the Bignoniaceæ, an order of which the chemical and physiological properties are little known. The drug had been received, with others that need investigation, from Dr. Dymock, of Bombay, and had been placed in the hands of Messrs. Naylor and Chaplin for chemical investigation by Mr. Holmes, who in the first of the two papers contributed a description and some particulars as to the history of the bark. From this bark Messrs. Naylor and Chaplin reported that they have separated what appears to be a characteristic principle that they have named "oroxylin." It forms lemon-yellow crystals, melting at 228·5°–229° C., readily soluble in alcohol, ether, glacial acetic acid and hot benzol, but practically insoluble in either hot or cold water. A minute quantity brought into contact with a drop of weak solution of sodium, potassium or ammonium hydrate gives immediately a cherry-red color, that passes quickly into brick-red and olive green. In alcoholic solution it reduces silver nitrate immediately, does not reduce Fehling's solution, and gives a white precipitate with mercuric chloride, and a golden-yellow one with subacetate of lead. In addition, there have been separated an acrid principle, an astringent substance not precipitable by solution of gelatin, a compound reducing Fehling's solution, fat, wax, pectin and chlorophyll.

Green iodide of mercury was one of the substances omitted from the last edition of the British Pharmacopœia, presumably on account of its instability. As there is still a considerable demand for such a compound for medicinal use, Messrs. Martindale and Salter have applied themselves to remedying, as far as possible, the defects that led to its exclusion from the official work. This they propose to do by using in its preparation one-fourth more of mercury than the quantity required theoretically, and modifying the directions of the B. P., 1867. A drachm of rectified spirit is poured upon an ounce and a quarter of mercury in a porcelain mortar, and iodine is added gradually up to 278 grains, triturating constantly and adding more spirit occasionally to prevent over-heat-

ing and formation of red iodide. The trituration should be continued until all metallic globules have disappeared, and the mass assumes a uniform green color, when it should be dried by exposure to the air on filter paper in a dark room and preserved in an opaque bottle. The product will contain about 12·6 per cent. of free mercury, a quantity that has been found by a specialist to be no detriment, and which was exceeded in a commercial sample examined. The authors state that pills of green iodide of mercury are best massed with sugar of milk, syrup and gum, and their sap-green color may be taken as evidence of quality. The pills may be coated with sandarach solution, and should be sent out in amber-colored bottles. The paper evoked considerable discussion, and there was a decided divergence of opinion as to whether the instability of a preparation justified its exclusion from the Pharmacopœia or really made it more desirable that there should be an official standard and an authorized method of preparation.

Cream of Tartar.—Mr. H. Broadbent gave the average results of the examination of a large number of samples of cream of tartar, of French, Italian, Spanish and German origin, from which it appeared that the article comes into this country from all these sources of tolerably uniform quality, answering fairly well to the requirements of the British Pharmacopœia.

At this moment, Sir Frederick Abel, the President of the British Association, entered the theatre, together with Professor Thorpe.

The next communication partook of the nature of a blackboard demonstration by Mr. John Hodgkin, having for its object to explain from a chemical point of view the constitution of the principal *new synthetic remedies*, and to show their relationship one to another. Commencing with the fatty group, the methane derivatives were first illustrated by graphic formulæ, including methyl chloride, methylene chloride, chloroform, methylal, amylene hydrate, sulphonal, trional and tetronal. Next came the compounds of the formic acid type, such as hypnone, urethane, paraldehyd, chloral, ural, somnal, chloralamide and butyl-chloral. The aromatic series of synthetic remedies was also for convenience divided into two groups, the benzene group, including the aniline, benzoic acid and phenol derivatives, and the naphthalene group, including the naphthylamine, naphthoic acid, naphthol and quinoline derivatives. Of the first group there were illustrated acetanilide, benzanilide, exalgine, pyrodin, antithermin, antipyrin, antisepsin, phenacetin, methacetin, methylphenacetin, benzoic acid, salicylic acid, salol, dithiosalicylic acid, phenol trichlorphenol, aseptol, sozoiodol, cresalol and aristol. The second group included thermine, α- and β-naphthol, betol, quinoline, kairolin, kairin, thallin, orexin and iodol.

At the close of the paper, Sir Frederick Abel expressed the pleasure it had given him to be able to visit the Conference during its sitting, and assured the members of his sympathy in their efforts to advance the chemical side of pharmacy.

Estimation of Mineral Oil.—It is frequently found that the "recovered oils" supplied for use in the woollen and leather industries contain large quantities of mineral oil or unsaponifiable or resinous matter, which is difficult to estimate. A method for effecting this was described by Messrs. Fairley and Burrell.

Cotton Seed Oil in Lard.—Messrs. Fairley and Cooke suggested a method for detecting the presence of cotton-seed oil in lard based upon a slight difference in the specific gravity.

Mr. Fairley also read a note giving the results of an *analysis of bile.*

Mr. William Kirkby brought under the notice of the Conference a sample of *adulterated saffron.* The sophistication consisted of fibres apparently derived from a species of sedge, which were present to the extent of 41 per cent. The paper was accompanied by drawings showing the figure of the fibre and its histological structure.

Menstrua for Tinctures.—In a paper illustrated by several tables, Mr. R. Wright reported upon the solvent action of alcohol of different degrees of strength on some of the drugs used in making pharmacopœial tinctures. The menstrua experimented with in the case of the tinctures for which rectified spirit is officially ordered were of four degrees of strength, namely, rectified spirit, rectified spirit four volumes and water one volume, rectified spirit three volumes and water one and proof spirit. For the proof spirit tinctures were used proof spirit, rectified spirit, rectified spirit three volumes and water one volume, and rectified spirit and water equal volumes. The process adopted was maceration of the powdered drug for ten days, at the end of which the clear liquor was poured off, the marc strained and pressed and the united liquors filtered. Altogether, forty-eight of the official tinctures were made and the results were given in two tables, one showing the amount of extract yielded by a fluid ounce of the tincture, and the other showing the amount of alkaloid yielded by a fluid ounce of the alkaloidal tinctures. It is considered that the general results show that some at least of the menstrua for the official tinctures might be modified with advantage, and that several of them might be made with menstrua of slightly less alcoholic strength.

Mr. E. H. Farr, also, in some practical notes on certain *alkaloidal tinctures,* described some experiments undertaken with a view to discover whether the official alcoholic menstrua, or some others, are those best suited to extract the medicinal properties from the drugs operated upon. In making the tinctures, menstrua containing a known number of volumes of absolute alcohol in ten volumes of the liquid were employed, and the drugs in powder were macerated and percolated, the last portions being displaced by more menstruum until the desired volume was obtained. The tinctures were examined as to their contents in alkaloid and in extractive, their miscibility with water and with alcohol, and their appearance after having been kept a few months. The best results were obtained by using for each of the following tinctures a menstruum containing the specified number of volumes of absolute alcohol in ten volumes : aconite, 7 ; belladonna, 9 ; henbane, 7 ; stramonium, 7 ; colchicum, 5 ; gelsemium, 7 and 9 equal ; jaborandi, 3 ; veratrum, 5 ; cinchona, 7 ; conium, probably 5 ; and digitalis, 7. For opium, proof spirit and menstrua containing 4, 3 and 2 volumes of absolute alcohol in 10 were used, but in no case was the opium thoroughly exhausted, but the tinctures made with the lower strength menstrua were on the whole richer in morphine.

Extract of malt was the subject of the next two papers. In the first, Mr. J. C. Umney commenced by commenting upon the want of uniformity in malt extracts, especially in respect to consistence and diastasic power. The latter

point was shown by the fact that the time taken by ten grams each of six samples of English make and two of German to convert an equal weight of starch at a temperature of 100° F. ranged from four minutes to upwards of two hours. Mr. Umney then described a process for liquid extract of malt yielding a product said to give an average indication of diastasic strength equal to a semi-solid extract, being capable of converting its own weight of starch in six minutes. This liquid extract was further affirmed to be elegant in appearance, exceedingly palatable, and not prone to fermentation, solidification or any of the changes to which the semi-solid extract is liable. In the second paper, Mr. D. B. Dott discussed the merits of methods followed in the estimation of the diastasic value of malt extract, and expressed preference for a modification of that suggested by Duggan. This consists in digesting 5 cc. of a 5 per cent. solution of the extract for half an hour with 400 cc. of a liquid containing 2 per cent. of arrowroot at a temperature of 55° C., adding 10 cc. of a 10 per cent. solution of soda to stop the action, and diluting the mixture to measure 500 cc. This is then tested as to its reducing power on Fehling's solution and the result corrected by deducting the equivalent of the malt extract itself. Mr. Dott considers that under these conditions a good extract of malt may be expected to produce from starch not less than three times its weight of sugar, calculated on the basis that each 10 cc. of Fehling's solution is equal to 0·0807 gram of maltose.

Buchu.—Mr. C. J. S. Thompson dealt with the comparative medicinal values of the three kinds of buchu leaves that are official in the British Pharmacopœia. The investigation was undertaken in consequence of an observation that an infusion prepared from leaves of *Barosma serratifolia* was not so active or effectual as others prepared from leaves of *B. betulina* and *B. crenulata.* This appears to have been confirmed by a comparative examination of leaves of the three species. The therapeutic properties of the leaves are said by Spica to reside in the volatile oil and a bitter resin. The microscope showed that the oil-cells in the underpart of the leaf were closer together and much larger in the *B. crenulata* and *B. betulina* leaves than in those from *B. serratifolia.* Upon distillation *B. betulina* leaves yielded an average of 1·45 per cent. of volatile oil, which developed after a time a strong peppermint odor; *B. crenulata* leaves also yielded 1·6 per cent. of the oil, while *B. serratifolia* leaves gave barely 1 per cent. As to the resin, upon being exhausted with ether, the *B. betulina* leaves gave up 4·25 of dark olive-green resinous matter, slightly soluble in water, more so in alcohol and freely in chloroform, aromatic, but bitter to the taste, and having the characteristic odor of buchu. *B. crenulata* leaves treated in a like manner gave 3·75 per cent. of resinous matter, similar in color and taste. *B. serratifolia* leaves gave 3·45 per cent. of resin, but different from the other products in color and taste. The mucilage precipitated from a fresh infusion of *B. serratifolia* leaves was also less in quantity than that from an infusion from either of the other species, and from the general inferiority of this kind, Mr. Thompson suggests that it should no longer be employed in making the officinal preparations.

Syrup of Hypophosphite of Iron.—Mr. John Macintyre showed the instability of the syrup made according to the B.P.C. formulary, samples having been returned to the author with the complaint that they had become milky. He

states that the difficulty may be overcome by the addition of citric acid in the proportion of one-quarter of a grain to one ounce of syrup.

Mannas.—Mr. D. Hooper has brought together some published information upon eastern mannas, which he has supplemented with other results obtained by himself. The solubility of the different mannas appears to vary greatly, ranging from one in one-half to one in twelve of water. All of them are said to contain a substance reducing Fehling's solution, and out of eleven compared in a table ten are represented as dextro-rotatory. Incidentally Mr. Hooper mentions a report that the manufacture of sugar from cotton-seed cake is about to be instituted, the product being alleged to be fifteen times sweeter than that from the sugar-cane and twenty times sweeter than sugar from the beet.

Curry Leaves.—The last paper, by Dr. Mootooswamy, had for its subject an Indian drug, consisting of the leaves of the "curry leaf tree" (*Murraya Kœnigii*, Spreng.). The tree, which belongs to the Rutaceæ, is well known in Southern India, and the highly fragrant leaves are used by the natives for seasoning curries. The leaves are also employed in native medicines, being credited with aromatic, stomachic, stimulant, astringent and tonic properties. Mr. Prebble has obtained from them a small quantity of essential oil resembling that yielded by the leaves of *Ægle Marmelos*, as well as two resins and a glucosidal bitter principle that he has named "kœnigin."

Mr. Naylor then called attention to nine volumes, which had been selected by the executive of the Leeds Chemists' Association, for purchase out of the annual grant made from the Bell and Hills Fund to the library of the local association in the town that the Conference happens to be visiting.

The Committee on Unofficial Formulary was reappointed; and Cardiff, the metropolis of South Wales, was then selected as the place for holding the next annual meeting.

Mr. William Martindale was elected President of the Conference; Messrs. Carteighe, Kinninmont, Thresh and Munday, Vice-Presidents; Messrs. Naylor and Ransom, Hon. Gen. Secretaries, and Mr. A. Coleman, Hon. Local Secretary. After votes of thanks the Conference adjourned, and the members took a carriage drive to Roundhay Park; and on Thursday morning an excursion was made by rail to Embsay, from which point Barden Tower, Bolton Abbey and Ilkley Wells were visited.

AMERICAN PHARMACEUTICAL ASSOCIATION.

The thirty-eighth annual meeting of this Association convened in the Concert and Ball Room of the Hygeia Hotel, at Old Point Comfort, Va., on the afternoon of Monday, September 8, when owing to the death of President Emlen Painter, the First Vice-President, Karl Simmon, of St. Paul, took the chair. A brief address of welcome was given by Mr. T. Roberts Baker, of Richmond, Va., and responded to by Mr. Alexander, of St. Louis, Mo. Then Vice-President Eckford, of Mississippi, occupied the chair, and the President read his annual address, in which he alluded feelingly to the decease of Mr. Painter, and to his labors in behalf of pharmacy; the action of the Convention for the revision of the U. S. Pharmacopœia was commented upon, and more particularly the introduction of the metric system and the advisability of admitting into the

Pharmacopœia many of the synthetical chemicals which have, of late years, been extensively employed in medicine. The formation, by the American Medical Association, of a new Section on Materia Medica and Pharmacy, was referred to, and its importance was pointed out for the discussion, by representative physicians and pharmacists, of questions in which both professions are mutually interested. An invitation had been received to participate, by delegates, in the celebration of the sixth centenary of the University of Montpellier, and had been responded to with suitable congratulations. Referring further to the work before the different sections of the Association, the address closed with expressions of thanks to officers and members for assistance rendered to the President. The address was then referred to a committee of three for consideration, and report at a subsequent session.

After the election of seventy-eight new members, reports of committees were received and notice was given of an amendment to the By-laws, which was adopted at a later session, and enables the President, in the appointment of a Nominating Committee, to select from the Association at large, whether the members be delegates or not. When the Nominating Committee was appointed it was found that the following states and districts were represented, viz: Alabama, Arkansas, Connecticut, Columbia, Delaware, Florida, Georgia, Illinois, Indiana, Iowa, Kansas, Kentucky, Louisiana, Maryland, Massachusetts, Michigan, Minnesota, Mississippi, Missouri, Nebraska, New Jersey, New York, North Carolina, Ohio, Pennsylvania, Tennessee, Texas, Virginia, West Virginia and Ontario, Can. The associations of several other states had appointed delegates, who, however, were not present. A delegation from the National Wholesale Druggists' Association was in attendance.

Remarks in eulogy of the late President Painter were made by Messrs. Bedford, Alexander, Maisch and Remington.

The minutes of the Council were read and approved by the Association, and a number of the reports, which had been examined by the Council, were read in full for the information of the members. The Treasurer reported receipts from annual dues amounting to $5,825, and from other sources $4,686.39; total receipts, $10,511.39. The disbursements were: For Proceedings, $1,9077.06; for salaries, $2,300; other expenses, $2,093.76; leaving a cash balance on hand, July 1, of $4,140.57.

The report on the National Formulary showed the cash receipts during the year to have been $1,388.18, and the disbursements for this account $465.77. The total profit to the Association from this source since the publication of the work in 1888, over all expenses connected with it, was $1,664.23, exclusive of the copies distributed gratuitously to members and others. The committee that had been appointed in 1888 to visit the American Medical Association reported upon their visit and its results, giving also the action of the Association taken at its meeting in Nashville, in May last, relative to the creation of a new Section which had been referred to in the President's address. In the discussion following, the appointment of a representative committee from this Association to the newly-created Section was generally urged, but opinions differed as to whether a Section should be formed in this Association for the special purpose of receiving medical men with the view of discussing questions of interest to both professions. Upon motion of Professor Sayre, a committee

was then directed to be appointed to consider and report upon the relations between the American Pharmaceutical Association and the American Medical Association.

The Committee of Revision of the U. S. Pharmacopœia being in session at Old Point Comfort, on motion of Prof. Whelpley, the members of that committee, who are not members of the Association, were invited to attend the sessions with the privileges of the floor.

Second session.—After the reading and approval of the minutes of the preceding session, the Nominating Committee presented the following nominations for officers for the ensuing year: President, Alfred B. Taylor, Philadelphia; Vice-Presidents, A. B. Stevens, Ann Arbor, Chas. E. Dohme, Baltimore, and J. M. Good, St. Louis; Permanent Secretary, John M. Maisch, Philadelphia; Treasurer, S. A. D. Sheppard, Boston; Reporter on the Progress of Pharmacy, C. L. Diehl, Louisville; and Members of Council, P. C. Candidus, Mobile, C. F. Goodman, Omaha, and H. M. Whelpley, St. Louis. The nominees were duly elected.

The minutes of the Council sessions were read and approved; 25 new members were elected, and amendments to the by-laws were adopted, consolidating the two sections on legislation and on education into one. Various reports were read, among them the report on prize essays, awarding the Ebert prize for the past year to Prof. Wm. T. Wenzell, of San Francisco, for his essay on the coloring principles of flowers.

An amendment to the by-laws was offered, contemplating the re-establishment of an admission fee on joining the Association; the proposition was finally laid over until next year. The same disposition was made of an amendment to the constitution creating the office of Assistant Secretary; likewise of an amendment to the by-laws offered at the last session, creating a permanent Committee on Transportation, consisting of five members, including the Local Secretary and one member each from New York, Chicago, St. Louis and New Orleans.

A telegram conveying congratulations from the Kings County, N. Y., Pharmaceutical Association was received and directed to be acknowledged by letter.

The report of the committee on the President's address was discussed and adopted, ordering the appointment of a committee charged with drawing up suitable resolutions in reference to the death of the late President Painter; recommending to the Section on Education and Legislation the consideration of the subject of apprenticeship; approving of a conference of the Committee on Legislation with the State Secretaries for formulating a plan for the interchange of certificates of the State Boards of Pharmacy; and disapproving of the suggested election of the Presidents of State Associations as Vice-Presidents of this Association.

Propositions were made for holding the next meeting at Nashville, Tenn., and at Hot Springs, Ark., but they were ruled out of order at the time, and a committee was subsequently appointed, which reported in favor of holding the next meeting in New Orleans on the second Monday in May, 1891; a minority report favored St. Louis. The amendment to select the latter city was lost by a vote of 26 ayes against 64 nays, and the time for holding the meeting was finally referred to the Council to be changed, if necessary, so as not to clash with the meeting of the American Medical Association.

Communications were received from the Virginia Pharmaceutical Association inviting the members to attend the sessions of that body; also to be present at the lecture by Professor Remington on the metric system, to be delivered on Wednesday morning.

The Section on Commercial Interests held two sessions on Tuesday, Mr. Eliel occupying the chair. In his annual address the Chairman referred to the uselessness of efforts being made for abolishing the special liquor tax; the rapid increase of proprietary pharmaceuticals was characterized as a detriment to legitimate pharmacy, and it was suggested to ask the co-operation of the American Medical Association with the view of checking the evil; attention was called to the cutting in prices on proprietary medicines, and it was suggested that steps be taken for mutual insurance against fire.

Secretary Kilmer's report dealt likewise with price cutting; also with shorter business hours, trade unions by pharmacists, advertising of specialties, and with other matters of trade interests. A lengthy discussion took place on the various plans, which had been suggested from time to time to prevent the cutting of prices, co-operation of the retailers being recommended, also the joint manufacture of family medicines to take the place of such, the profit on which had been reduced through the so-called cutters.

The various questions having been referred to a committee, the report was considered at the evening session, when the conclusion was reached that in regard to the prescribing of proprietary preparations by physicians the best results would be accomplished through individual work; a conference was suggested between committees of the Pharmaceutical, the Wholesale Druggists' and the Proprietors' Associations; and a committee of five was appointed to mature a feasible plan for mutual insurance.

Mr. Henry Canning, of Boston, was elected Chairman of the Section, and Mr. W. L. Dewoody, of Pine Bluff, Ark., Secretary, and after installing the newly elected officers, and passing a vote of thanks to the retiring officers, the Section adjourned.

The Section on Scientific Papers held four sessions, including an adjourned one, for the reading and discussion of papers. Professor Whelpley occupied the chair and Professor Stevens acted as Secretary. The following papers were read:

The Constitutional Obligation of Congress Regarding Weights and Measures was discussed by Professor Oldberg in a lengthy paper giving the history of what has been said and projected on this subject during the past century, in the United States, and leading to the conclusion that "we have now no legalized standards and denominations at all, unless Sections 3569 and 3570, R. S., are to be construed as making the metric weights and measures our only legalized system." The following resolutions accompanying the paper were concurred in, and by the Association referred to a committee, with power to act.

WHEREAS, The Constitution of the United States imposes upon Congress the duty of establishing fixed standards of weights and measures for the use of the people; and

WHEREAS, The customary weights and measures in use in the United States are arbitrary, unsystematic, inconvenient and indefinite, being governed partly by English law, partly by tradition, and partly by chance; and

WHEREAS, No laws of the United States exist establishing a National System of Weights and Measures, or fixing the values of the customary units; therefore, be it

Resolved, By the American Pharmaceutical Association, that Congress be and is hereby respectfully requested to consider, without unnecessary delay, the importance of legislation upon this subject; and, further

Resolved, That it is the sense of this Association that it would be worthy of the dignity of the American nation to celebrate the four-hundredth anniversary of the discovery of America by the adoption of the decimal system of weights and measures in all governmental transactions and for purposes of foreign and interstate commerce, to take effect on the date of the landing of Christopher Columbus on this continent; and

Resolved, That copies of these preambles and resolutions be forwarded by the Secretary of this Association to the Speaker of the House of Representatives of the United States, to the Chairman of the Committee on Coinage, Weights and Measures of the House of Representatives, and to the Superintendent of the Bureau of Weights and Measures.

Percolation was the theme discussed by J. W. Eckford, of Mississippi, a review being given of various methods of percolation and of apparatus constructed for the purpose of insuring complete exhaustion as nearly as may be possible. While several of the pressure percolators that have been devised are quite favorably commented upon, the author's "experience is that the simpler the apparatus, the more available it is; and I think this is the opinion of the average retail pharmacist who manufactures for his own retail trade."

Syrup of Tolu is suggested by M. B. Travis, of Illinois, to be prepared by dissolving 1½ oz. of Tolu balsam in 4 fl. oz. of alcohol, using this menstruum in two portions, straining the solution, pouring it upon 28 oz. of loaf sugar contained in a percolator, and displacing with sufficient water to obtain 32 fluid ounces of syrup, which is stated to be clear, permanent, well flavored and to retain the acids of the balsam in complete solution.

Solution of Magnesium Citrate, according to Luther F. Stevens, of Brooklyn, should be made to contain the bibasic salt which, owing to its ready solubility in water, is difficult to crystallize, but is stated to be, therapeutically, the most active of the magnesium salts, and to have a pleasantly acid taste even when no free acid is with it. Its solution is more readily prepared than that of the tribasic salt; and with less material to the same dose, and with the danger of crystallization removed, is the cheaper of the two. For the preparation of four bottles of the solution the following ingredients are employed: Magnesium carbonate, 484 grains; citric acid, 1,134 grains; syrup, 5 fluid ounces; oil of lemon, 1 minim; potassium bicarbonate, 120 grains, and a sufficient quantity of boiled water. The potassium salt may be replaced by the use, for each bottle, of 25 grains of pure sodium bicarbonate.

Belladonna Plaster, by S. W. Williams, of Orange, N. J.—The paper gives a brief review of the belladonna plasters as directed by different authorities, and from the recorded assays of belladonna root considers ½ per cent. of alkaloid to be the proper strength of the pharmacopœial plaster. Regarding the material to be employed in the preparation of this plaster, the author favors the use of an extract prepared from the rhizome of *Scopola carniolica*

(see this JOURNAL, Feb. 1890, p. 99), which he found to be of pretty uniform alkaloidal strength; the records of working with over 16 tons of the commercial rhizome show an average strength of 0·59 per cent. of alkaloid, estimated with Mayer's solution. The amount of extract obtainable from the drug increases with the decrease of the alcoholic strength of the menstruum, the alkaloidal percentage of the extract diminishing in an inverse proportion; thus with 94 per cent. alcohol, 13·15 per cent. extract, containing 4·10 per cent. alkaloid, were obtained, while 25 per cent. alcohol yielded 38·46 per cent. extract with 1·40 per cent. alkaloid. Using 80 per cent. alcohol, the yield of extract varied between 22 and 28, average 25·3 per cent., with a variation of alkaloid from 2·0 to 2·60, average 2·358 per cent. The paper describes also the manufacture of the plaster on the large scale, and is illustrated with photographic reproductions of the rhizome and of the machinery for the manufacturing of the plaster. A working process for determining the amount of alkaloid in the plaster by means of Mayer's solution is likewise described.

Fluid Extract of Ipecac.—T. J. Milner experimented with the different processes recommended for the preparation of this extract, using a root unusually rich in alkaloid, assaying 3·12 per cent. The fluid extract prepared by the pharmacopœial process contained only 46 per cent. of the alkaloids; by Rother's process (*Drug. Circ.*, 1884, p. 4) 45 per cent.; by Robbins' formula (AMER. JOUR. PHAR., 1883, p. 128) 75 per cent. the extract forming a precipitate; by using as the menstruum alcohol and water in the proportion of 4 : 1, 85 per cent.; and with the same menstruum, but following Rother's process, with magnesia, 80 per cent. of the alkaloid was contained in the fluid extract.

Emetine valuation of Fluid Extract of Ipecac is effected, by W. Simonson of Cincinnati, by a process depending upon the removal of resinous matter from the acidulated extract by means of ether, liberating the alkaloid with ammonia, extracting it with ether, evaporating to constant weight, and weighing. The sulphate dried over sulphuric acid, was analyzed, yielding 81·35 alkaloid, 15·73 sulphuric acid, and 3·08 water. From these and other determinations the author calculates 508 to be the molecular weight of emetine, which agrees with Kunz's formula $C_{30}H_{40}N_2O_5$, determined in 1887. Estimating upon this basis the purity of the alkaloid in the ether residue as obtained above, it was found to assay in six determinations between 98·4 and 99·7 per cent.

Cascara sagrada and its allies was the subject of a discourse by Professor H. H. Rusby. It was made particularly interesting through the exhibition of botanical specimens, and of specimens of bark from branches and old wood. *Rhamnus californica* grows sparingly in Northern California, but becomes more abundant southward and eastward through Mexico and Arizona, passing into several varieties which have been regarded as distinct species. On the other hand, *Rhamnus Purshiana* becomes abundant from Northern California northward, so that the place of collection furnishes presumptive evidence of the origin of the bark. The bark of the two species collected from older wood cannot well be distinguished in appearance, while the younger bark presents a few marks of distinction in the transversely elongated light-colored spots which, in *R. Purshiana*, are much more numerous, and persist for a much longer period than in the other species. The two barks are best distinguished from the arrangement and characters of their bast-bundles, resin-areas and medul-

lary rays, and Professor Rusby is preparing illustrations of these structural characteristics to accompany the descriptions in his paper.

An indigenous substitute for Cork was described in a paper by A. O. Ingalls, of Murray, Idaho. It is the suberous layer of the bark of the Douglas spruce, *Pseudotsuga Douglasii*, a large tree, growing from Colorado to Mexico and northward, and attaining its greatest proportions in Oregon. The corky layer is of good quality, but is apt to become fissured, which tendency seems to be lessened by protecting the bark against climatic influences. The layers are formed earlier and on younger trees than is the case with the cork oak, and since the quality appears to be promising, this probable source of cork for industrial use deserves closer attention than it has thus far received. Unfortunately, the specimens sent by Mr. Ingalls did not reach the meeting.

The inorganic ingredients of commercial Asafetida have been investigated by W. A. Puckner, of Chicago. Besides the insoluble sand, etc., the ash contained alumina, iron, and sulphate and carbonate of calcium and magnesium ; its amount from different specimens varied from 19 to 56 per cent. Curiously enough, a specimen of powder, labelled *purified*, yielded over 55 per cent. of ash. We have always found the tears to be free from this inorganic admixture, which is present in that portion of commercial asafetida agglutinating the tears.

Iodoform.—On this subject two papers were presented, one by E. R. Boyce, recommending its preparation by the process of Sulliot and Raynaud (see AMER. JOUR. PHAR., 1889, p. 175) ; it yields 98 per cent. of the iodine.

The second paper, by C. H. Wise, recommends the following test of identity : On heating an alkaline solution of resorcin with a little iodoform, a red color is produced. For recognizing the possible adulteration with picric acid, the reaction with potassium cyanide is recommended, whereby a deep red color is produced ; the acid should be dissolved in alkali. (See AMER. JOUR. PHAR., 1884, p. 212.)

Terebene, as met with in commerce, was examined by F. A. Thompson, of Detroit. Four specimens were of American and one of German make ; all affected polarized light with a varying right rotation, and had boiling points differing from that of pure terebene. The results agree with those reported by Messrs. Jayne and Chase, in AMER. JOUR. PHAR., 1887, p. 65.

Albuminate of Iron and its preparations, by Dr. A. Tsheppe, of New York, is the title of an essay in which also the ferric compounds of sugar, dextrin and allied substances are considered. These compounds are generally formed by mixing a solution of the body with that of a ferric salt, when on neutralizing the mixture, a precipitate of the new compound will be produced ; the further addition of alkali causes the solution of the precipitate, the alkali entering into combination. The normal ferric salts may be replaced by basic salts for forming analogous compounds, richer in iron, with crystalloids like sugar or glycerin. But colloids like albumin or dextrin or gum arabic prevent the formation of basic iron compounds. Since alkaline solutions may contain a large excess of albumin, and acid solutions a large excess of iron, the precipitates obtained from such solutions may vary largely in their composition, in the former case through the simultaneous precipitation of a derivative of albumin. Solution of ferric chloride, U. S. P., was found to combine

with one part by weight of each of the following substances, viz: 0·92 with glycerin, 0·42 with cane sugar, 1·72 with mannit, and 1·05 with egg albumin. Of the latter, one part requires 7½ to 8½ parts by volume of dialyzed iron containing 5 per cent. Fe_2O_3. In all these cases the combination is effected only while the ferric hydrate is in the nascent state, since freshly precipitated ferric hydrate does not dissolve in a solution of sugar or similar substance. The author then dwells upon the principal characters of egg-albumin and of its derivatives produced by the influence of acids, alkalies, coagulation and digestion, all of which—peptone excepted—are precipitated from their solutions by sodium chloride or sulphate, or by magnesium sulphate, while peptone is precipitated by ammonium sulphate. Peptone does not, like albumin, form a chemical compound with iron, and the so-called peptonates of iron, met with in commerce, usually contain, in the place of peptone, coagulated albumin dissolved in alkali; but even if containing peptone (or digested albumin) the preparation would be simply a "solution of peptone and iron." The treatment of a ferric precipitate and albumin or similar substance with an insufficient amount of alkali may result, instead of in complete solution, in the decomposition of the compound, the solution of the albumin and the removal of the ferric hydrate. Solutions of basic ferric albuminate may be more simply made by mixing specific quantities of albumin and dialyzed iron in admissibly diluted solutions, with the precaution that the albumin be first deprived of its alkalinity.

In answer to a question Dr. Tsheppe stated that on taking ferric albuminate internally, it would be decomposed by the free acid of the gastric juice; such preparations are, probably, not superior to most other liquid preparations of iron.

Pepsin.—This subject was treated by Dr. Eccles, of Brooklyn, in two lengthy papers, one of them being entitled "What is Pepsin?" The author states that a solution of pepsin heated to boiling becomes milky, the precipitate settling in a short time in the presence of a little free HCl; this precipitate is stated to be always in exact proportion to the digestive power of the pepsin, and is called by the author peptose. The amount of such peptose is proposed by him for the gravimetric determination of pepsin. In regard to commercial pepsin the author states that "if we define dirt as matter out of place, it might be characterized as a lot of dirt with a trace of pepsin."

In the second paper Dr. Eccles discusses the testing of pepsin for pharmacopœial purposes; while he believes the gravimetric method by boiling to be the most exact one, he thinks that it should be more thoroughly tested. For determining the digestive power of pepsin, he recommends that albumin of eggs be diluted with three times its bulk of water, the mixture strained through muslin or cotton, 40 cc. of the strained mixture to be boiled for ten minutes, and the liquid then diluted to 50 cc. by the addition of water and the requisite amount of HCl. The mixture has the appearance of an emulsion from the finely divided coagulated albumin; it is digested at 109° F. with the desirable quantity of the pepsin to be tested, the complete solution of the albumin being indicated by the change of the mixture in appearance from opacity, through translucence and slight opalescence, to transparency.

An animated discussion followed the reading of these papers, and some of the experiments as well as conclusions arrived at were strongly criticised.

Pharmacists as food inspectors was the title of a paper read by L. M. Connor, of Dallas, Tex., in which pharmacists were recommended to apply themselves to the chemical and microscopical examination of articles of food and drink. This led to a discussion on defining adulterations, on adulteration laws, and on the results attained through the enforcement of such laws, for which latter purpose the salutary effect of the Massachusetts law was specially cited.

The utilization of the Soda products of Kentucky was discussed in a paper by J. P. Barnum, of Louisville. The process described is a modification of that of Solvay.

The Florida Phosphate fields were discovered in 1889, near Dunellen, Marion County, and extend through several adjacent counties of Central Florida, coprolites being found in Peace River and other streams. The paper by Dr. H. Robinson, of Jacksonville, gives the history of the discovery, and of the development of the new industry; it also furnishes the results of an analysis of 1, laminated Dunellen phosphate, and 2, of Peace River caprolite, viz:

	1.	2.
Lime,	53·31 per cent.	58·40 per cent.
Phosphoric acid,	33·40 "	27·70 "
Sand and insoluble matter,	6·32 "	9·60 "
Ferric oxide,	3·05 "	1·85 "
Alumina,	2·40 "	1·40 "
Carbonic acid and loss,	0·72 "	1·05 "

The paper on *ethereal oil of Polygala species*, by Henry C. C. Maisch, is printed in full in the present number.

The Section elected Prof. E. L. Patch, of Boston, Chairman, and Prof. C. S. Hallberg, of Chicago, Secretary, for the ensuing year.

The Sections on Pharmaceutical Legislation and on Education having been consolidated, they met on the evening of Thursday, Professor Bedford presiding, and Professor Stevens, Secretary. The Chairman read an address presenting various subjects of interest to the Section, after which papers on Methods of Instruction were read by Professors Rusby, of New York and Simon, of Baltimore. Considerable discussion was had on this topic in which, among other matters, the value of good school education was prominently brought forward; also the variable educational status of apprentices in pharmacy, the value of practical experience in the store before attending lectures, apprenticeship in stores where but few preparations are manufactured or where merely scanty facilities for practical work are obtainable, etc. A paper by Professor Whelpley, giving a "Synopsis of a Course in Microscopy for Pharmacists," was then read and commented upon.

On the subject of Legislation Mr. H. M. Whitney, of Massachusetts, read a paper, giving from his experience a method for the examination of candidates by Board of Pharmacy, the object being the determination of the candidate's general knowledge of the various drugs, of compounding and dispensing, of chemical and mechanical incompatibles, of solubility, explosives, corrosives, specific gravity, ability to interpret hieroglyphics and abbreviations, etc. In process of time, there may probably be elaborated a fairly uniform method of examination, and then an interchange of certificates brought about; but, the author thinks, active and aggressive efforts to do it now would hazard, if not absolutely remove, from some sections, all there is to-day.

The Section elected as Chairman for the ensuing year Professor W. Simon, of Baltimore, and as Secretary, Mr. F. C. Hogan, of Illinois.

The final Session of the Association took place on Friday morning. After the reading of the minutes of the previous sessions and of the Council meetings, Mr. A. K. Finlay was elected Local Secretary, and a motion was adopted, making him Chairman of the Committee on Arrangements, with power to select his associates. Upon the recommendation of the Council a Committee on Transportation was appointed, consisting of Messrs. Alexander, of St. Louis; Main, of New York; Gordon, of Cincinnati; Jamieson, of Chicago, and the Local Secretary.

A committee was directed to be appointed, upon motion by Prof. Remington, to carefully consider the resolutions offered by Prof. Oldberg, and to report what action this Association should take in endeavoring to secure the adoption of the metric standards by the Government. The committee consists of Messrs. Remington, Oldberg, Rice, Hallberg and Manning.

On motion of Mr. Hallberg resolutions were passed, that it would be desirable that the International Pharmaceutical Congress meet in Chicago in 1893; that a hearty invitation be extended to the pharmacists of all countries to be present at the meeting of this Association in 1893, and that a committee be appointed to report upon the matter at a future meeting.

Mr. Connor read a telegram from the Mayor and the President of the Board of Trade, of Dallas, Tex., inviting the Association to hold its next meeting in that city. The communication was received with thanks.

The officers-elect were then installed and on taking their stations expressed their thanks. Mr. Taylor, the President-elect, referred to his presence at the organization of the Association in 1852; and Mr. Maisch to his attendance at the meeting in 1857, and that soon thereafter work had been assigned to him, since 1865 the Secretaryship, and notwithstanding his resignation had been again presented last year, it had been rejected. It will doubtless be of interest in connection with the early history of the Association to refer to its forerunner, the Convention of Delegates from Colleges of Pharmacy, which was held in New York in October 1851. Of the accredited delegates then present, we believe, that only Samuel M. Colcord, of Massachusetts; George D. Coggeshall, of New York, and Mr. Taylor are still living. The latter acted as Secretary of the Convention, which issued a call for a convention of pharmacists for the organization of a National Association to meet every year. This Convention met in Philadelphia, October 6, 1852. Of the delegates then present Messrs. Joseph Burnett, of Boston; S. M. Colcord and G. D. Coggeshall are still living, the last two having been Vice-President and Secretary, respectively, at that meeting; and of the other members Eugene Dupuy, of Brooklyn, Charles A. Heinitsh, of Lancaster, Pa., and the present President of the Association.

After the installation of the officers a telegram was read from Dr. Frank Woodbury, Chairman of the Committee on Materia Medica and Pharmacy, American Medical Association, inviting, in conformity with the action of the latter body, the sending of delegates to attend the next meeting at Washington. In response to this invitation the appointment of twenty-five members to serve as delegates was ordered. In order not to conflict with the meeting of

the American Medical Association the Council was empowered to change the date of meeting in New Orleans, if necessary.

After passing the customary resolutions of thanks, the Association adjourned.

Ample accommodations had been provided by the Arrangement Committee at the spacious Hygeia Hotel, where, during the latter part of the first week in September, the members began to make their appearance. Early on Sunday morning the steamer *Carolina*, from Baltimore, landed a party at the hotel, and during the afternoon a party from farther east arrived, having sailed from New York by sea to Norfolk. Most of the western members reached the place of meeting on Sunday evening, having come from Cincinnati by rail over the picturesque Chesapeake and Ohio Railroad, while many of the members from New England, who had taken the steamer at Boston for a sea voyage, were detained by fog, and did not arrive until early on Tuesday morning. Many of the southern members who came by rail, had likewise been detained on the road, causing an unlooked-for postponement in their arrival. All were comfortably installed in the hotel, whence attractive views are had over Fortress Monroe, the Chesapeake Bay and Hampton Roads, many of the points being of historical interest. Considering the locality and its surroundings it was strange that, during their stay, quite a number of the visitors were for a time troubled with gastric disturbances; however, the majority escaped such an inconvenience.

The neighboring fort was frequently visited to see the grounds and works, or to witness the drills or parades of the garrison. Carriage drives were taken through the surrounding country, and frequent visits were made to the village of Hampton, its churches and schools, the Soldiers' Home and the National Cemetery. The briny waters of the bay invited to sailing and fishing excursions, and conjointly with the warm atmosphere rendered bathing and swimming a pleasurable exercise. Monday evening was devoted to a reception in the ball-room, combined with music from the military band, and followed by dancing. At the entertainment on Wednesday evening the principal attraction was a picked choir from the Hampton Institute with their quaint songs. Thursday morning saw the members prepared for an excursion by steamer to Norfolk, and thence by rail to Virginia Beach, the famous seashore resort on the Atlantic Ocean. This was a departure from the usual custom of not having any diversion from business, except for the ladies, during the day-time, until after the final adjournment. Similar arrangements may probably be made on other occasions, devoting an hour or so to the visit to some point of interest near the place of meeting; if such an opportunity be not given to the visiting members they are apt to make such visits at a time set apart for the sessions.

After the final adjournment on Friday most of the members left Old Point Comfort, shortly after noon, by special train for Richmond, where they found carriages in waiting for a drive of several hours through the most interesting parts of that interesting city. The drive over, a number of the visitors had to commence their homeward journey; but the largest number remained over night at the Exchange Hotel, and on Saturday morning boarded the train which was to convey them to the famous Natural Bridge, which, owing to obstruction from a wrecked train, was reached later than had been expected. The chasm and the cataracts were seen at night illuminated by colored flames,

causing a magnificent spectacle, and were visited again on the following morning. Again a number of the party had to separate, but full one hundred took a special train for Luray, arriving there Sunday evening. The celebrated caverns were visited by many during the night, to enable them to take a morning train towards home; while others tarried at charming Luray Inn for a day or two, before completing their homeward trip, or visiting White Sulphur Springs, Washington, or other places of interest.

PHARMACEUTICAL COLLEGES AND ASSOCIATIONS.

Philadelphia College of Pharmacy.—Among the improvements which have been introduced for the approaching session, is to be mentioned the lighting of the lecture-rooms and of other parts of the buildings by electricity, and measures for perfecting the ventilation, more particularly of the laboratories. The material for instruction has also been considerably amplified in the different departments.

The Colleges of Pharmacy in Chicago.—During the past summer negotiations were opened between the Chicago and Illinois Colleges of Pharmacy with the view of consolidating the two institutions. We regret to state that these efforts have failed. The faculty of the Chicago College having resigned, with the exception of Professor N. G. Bartlett, the vacancies were filled by calling Professor C. S. Hallberg, Ph.G., to the Chair of Pharmacy, Professor Albert G. Manns, Ph.G., Ph.D., to the Chair of Chemistry, and Professor Henry C. C. Maisch, Ph.G., Ph.D., to the Chair of Materia Medica and Botany. On the other hand, the Illinois College has attached to its faculty Professor E. B. Stuart in the Chair of Materia Medica and Pharmacognosy, and Professor E. S. Bastin in the Chair of Structural and Systematic Botany.

We sincerely hope that a union of the two colleges may yet be effected at no distant day.

The Colorado Pharmacal Association, which was organized at Denver, on Tuesday, September 16, is the first state association discarding the term "Pharmaceutical," and adopting in place thereof the designation "Pharmacal." This adjective was suggested by the late Professor Edward Parrish, in a paper read before the American Pharmaceutical Association, in 1866 (see *Proceedings Amer. Phar. Assoc.*, 1866, p. 263). The word, though admitted to be good in construction, was rather objected to for want of euphony (*Ibid.* p. 78), and since that time has been used only to a very limited extent, like the term "pharmacial," which was suggested at the same meeting. On the other hand, the title "pharmacist," though not entirely unknown at that time, was advocated by Prof. Parrish, and in a comparatively short time took the place of "pharmaceutist," which had been previously used in preference. The title was adopted by a small majority upon the statement that "Pharmacal" was considered to be more modern and better English than "Pharmaceutical."

The Convention met at Odd Fellows Hall, and organized by electing John Best, of Central City, Temporary Chairman, and Felix A. Lyneman, of Denver, Temporary Secretary. A Constitution and By-Laws were considered and adopted, and permanent officers were elected, as follows: Chas. M. Ford, Denver, President; S. T. Kostich, Leadville, and Chas. Newman, Durango, Vice-Presidents; F. A. Lyneman, Secretary, and J. W. Turrell, Treasurer.

Measures were taken for the incorporation of the new association. The Chair was empowered to select delegates to attend the Interstate Pharmaceutical Convention, at Excelsior Springs, Mo., next year, and delegates to the American Pharmaceutical Association were elected. Quite a number of papers were read at this, the first meeting. Namely: *On Defects of the Pharmacopœia*, by C. M. Ford; *On Poison Law*, by C. S. Prowitt; *On Blackberry Cordial*, by C. D. Lippincott; *On Mountain Sage*, by N. Anderson; *On Colorado Cough Root*, by J. Kochan; *On Training of Apprentices*, by Mr. Dahl; and *On the Manufacture of Fluid Extracts by Pharmacists*, by C. D. Lippincott.

The next meeting will be held at Colorado Springs, September 8, 1891; the Local Secretary is G. B. Storer.

The North Dakota Pharmaceutical Association convened in fifth annual convention at Grand Forks, August 5, President Christianson in the Chair. The usual routine business was transacted. Papers were read "On the Practice of Pharmacy," by Dr. De Vaux, and "On Ferrous Chloride and its Preparations," by Frank Frisby, of Bismarck, the latter being awarded the Association's prize of $25. Mr. Frisby also received the prize offered for the best pharmaceutical preparations made by a member of the Association. Considerable discussion was had on the prohibition law of the state and its vexatious effects upon the legitimate drug business. A committee was appointed to draft a pharmacy law, and another committee to make arrangements for a joint meeting with the State Medical Society. Resolutions of thanks were passed to H. L. Haussamen, formerly Secretary of the Association, and now a resident of Costa Rica. The executive officers for the current year are: D. N. Siegfried, of Sanborn, President; L. C. Christianson, of Fargo, Secretary, and E. C. Maxcy, of Fargo, Treasurer.

The South Dakota Pharmaceutical Association met at Watertown, August 19, transacting the customary routine business, and listening to the reading of papers *On Instruction of Apprentices*, by R. T. Hill; *On Patent Medicines*, by D. S. White; *On Explosive Medicines*, by G. W. Lowry; *On Pepsin* of different manufacture, by J. A. Bower; *On Excessive Doses* in prescriptions, by J. H. Marshall; *On the Purity of Ice Water*, by R. M. Cotton; and *On the Study of Botany*, by Z. A. Crain.

A re-organization of the Association was effected in conformity with the new Pharmacy Law; W. A. Burnham, Croton, was elected President; I. A. Keith, Lake Preston, Secretary, and G. W. Lowry, Sioux Falls, Treasurer. Madison was selected as the place for holding the next meeting, August 20, 1891, with M. A. Bartlett as Local Secretary.

The Virginia Pharmaceutical Association met at its Ninth Annual Meeting in one of the parlors of the Hygeia Hotel, at Old Point Comfort, September 9 and 10; President Stratton in the Chair. The usual routine business was transacted, and papers were read *On Success in the Drug Business*, by W. A Strother; *On the National Formulary*, by E. A. Craighill; *On Digitalis*, by C. B. Fleet; *On Adulteration of Powdered Drugs*, and *On Soda Bicarbonate*, by Prof. Dunnington. The lecture by Prof. Remington *On the Metric System* was attended by this Association and by the American Pharmaceutical Association. E. R. Beckwith, Petersburg, was elected President; C. B. Fleet, Lynchburg, Secretary, and C. S. Lumsden, Lynchburg, Treasurer. The next meeting will be held at Roanoke, September 8, 1891.

The following printed Proceedings of State Pharmaceutical Associations have been received :

Delaware.—Fourth annual meeting. P. 68. See June number, p. 311. Among the papers read at the meeting and not previously noticed, the following may be mentioned : The Professional Standing of the Apothecary, by Dr. F. E. Stewart ; Household Ammonia, by F. R. Smith ; also, by the same author, papers on Face Powders, and on The Reaction between Iodoform and Potassium Chlorate.

Georgia.—Fifteenth annual meeting. P. 76. See June number, p. 311. The Association elected the following professors honorary members : John Attfield, of London ; Wm. Simon and D. M. R. Culbreth, of Baltimore ; C. F. Chandler and P. W. Bedford, of New York, and J. P. Remington and J. M. Maisch, of Philadelphia.

Louisiana.—Eighth annual meeting. P. 116, including Report of State Pharmacy Board. See June number, p. 311.

New York.—Twelfth annual meeting. P. 228. See August number, p. 428. A reprint of the valuable *Report on New Remedies* accompanies the volume. This Report has been compiled by Dr. Eccles, of Brooklyn, and Professor Vial, of Ithaca, and gives a brief characteristic of the remedies introduced within the past few years, including uses, doses, etc. Copies of this reprint may be procured from the Secretary, Clay W. Holmes, Elmira, N. Y., at 10 cents each, a reduction being made for ten or more copies.

North Carolina.—Eleventh annual meeting. P. 72, including Report of the Board of Pharmacy. The meeting was held in Morehead City, July 8 to 10. President Croom's address and the reports of the Treasurer, Secretary and of the several committees received due attention. Professor Venable having suggested the establishment of a School of Pharmacy in connection with the University of North Carolina, a Committee on Education, Wm. Simpson, of Raleigh, Chairman, was appointed to further the plan. Papers were read on Permanent Emulsions, by W. H. Wearn ; on Colorimetric Estimation of Morphine (by ferric ferricyanide), by S. J. Hinsdale ; on Eupatorium, by D. Herring ; Practical Notes, by E. V. Zoeller. The last-named gentleman was elected President, F. W. Hancock, of New Berne, Secretary ; A. S. Lee, of Raleigh, Treasurer, and R. J. Gooding, of New Berne, Local Secretary. The next meeting will be held at Morehead City, not later than the middle of July, 1891.

Rhode Island.—Seventeenth annual and semi-annual meetings. P. 19. The meetings were held January 8 and July 9, 1890.

EDITORIALS.

Remedy for Rhus poisoning.—The following communication, which explains itself, will be particularly appreciated by those of our readers, who are subject to poisoning from the exhalations of Rhus :

EAST LEVERINGTON AVENUE,
PHILADELPHIA, PA., August 26, 1890.

Editor PHILADELPHIA JOURNAL OF PHARMACY :—Having experienced great relief from the application of "Phénol Sodique" externally, undiluted, in a very annoying case of poisoning of the arms and hands by "poison ivy," while endeavoring to extirpate the vines, I take the liberty of submitting the facts, and with sentiments of profound respect, I remain, etc.,

B. F. BUTCHER.

A Libel Suit has been entered by William Radam, manufacturer of Radam's Microbe Killer, against the *Druggists' Circular*, of New York, for $200,000 damages, the largest amount so far as heard from that was ever asked for in a suit of this kind. The pleadings show that the action is brought to recover damages claimed to have been done the business of the plaintiff by an article published in the *Druggists' Circular* for September, 1889. This article gave the result of an analysis made by Dr. R. G. Eccles, who stated that a preparation identical with the Microbe Killer could be made at a cost of less than five cents per gallon for which Radam charged three dollars, by mixing oil of vitriol (impure) 4 drams, muriatic acid (impure) 1 dram, red wine, about 1 ounce, and well or spring water 1 gallon.

The *Druggists' Circular* expresses a desire to hear of any case in which unfavorable results have followed the administration of the Microbe Killer, or of any other fact that would be interesting under the circumstances. Should any of our readers be in possession of such facts, they are requested to communicate the same to that publication.

The American Public Health Association will hold its eighteenth annual meeting in the city of Charleston, S. C., December 16 to 19, next. Besides the papers which will be read, the following subjects will be presented for discussion: Heating, lighting, drainage and ventilation of houses; sewage disposal; maritime sanitation at ports of arrival; prevention and restriction of tuberculosis; isolation hospitals; climatic establishments for tuberculous persons.

REVIEWS AND BIBLIOGRAPHICAL NOTICES.

Arzneibuch für das Deutsche Reich. Dritte Ausgabe. Pharmacopœa Germanica, Editio III. Berlin, 1890. R. V. Decker's Verlag. 8vo. Pp. 432. Price, bound, Mark 2.30.

Perhaps the most striking difference of the present edition of the German Pharmacopœia from its predecessors is that it has been printed in the German language, instead of in the Latin tongue. But the names of the drugs and preparations are given in Latin with their German equivalents. It is impossible to give, within the limited space of this notice, a critical review of the contents of the book, and for the present we have to content ourselves with the enumeration of the most important changes regarding admission and rejection of officinals.

The following, which were contained in the second edition, have been dropped: Acet. digitalis, acid. carbol. crud., acid. hydrochlor. crud., antidotum arsenici, aq. aurantii, aq. menthæ crispæ, calc. phosphor. crud., castoreum, chininum bisulfuricum, chinoidinum, codeinum, cupr. oxyd., decoct. sarsap. compos. mitius, extr. aconiti, extr. cannab. ind., extr. digitalis, extr. graminis, extr. helenii, extr. quassiæ, extr. sabinæ, extr. scillæ, ferrum jodatum, fol. menth. crisp., gelat. carrag., gelat. lich. island., gland. lupuli, herb. cannab. ind., hydrarg. jodat., lactucarium, laminaria, linim. terebin., liquor corrosivus, liq. ferri sulf. oxydat., mangan. sulfur., morphin. sulfur., natrium benzoic., ol. aurant. flor., ol. cajeputi, ol. cocos, ol. rapæ, plumb. jodat., rad. helenii, rad. liquir. (Spanish), rhiz. graminis, rhiz. imperat., rhiz. torment., summit. sabinæ, syr. aurant. flor., tinct. aloes, tinc. asæ foet., tinc. cannab. ind., tinc. castor.,

tinc. chinoid., tinc. croci, tinc. ipecac., unguent. sabinæ, vin. chinæ, zinc. sulfocarbol.

The following have been recognized for the first time by the Pharmacopœia: acetanilidum, acid. trichloracet., æther bromatus, agaricinum, album. ovi sicc., amylenum hydratum, antipyrinum, bals. tolut., capsulæ, chinin. tannic., chloralum formamidatum, cocainum hydrochloric., extracta fluida (condurango, frangula, hydrastis and ergot), ferr. citric. oxyd., homatrop. hydrobrom., hyoscinum hydrobrom., keratin., liq. ferri album., liq. ferr. jodati, mentholum, naphthalin, naphtholum, paraldehydum, phenacetinum, physostigminum sulfuric., resorcinum, rhiz. hydrastis, salolum, sebum salicylat. (2 per cent. salicylic acid), sem. arecæ, sem. strophanthi, species diureticæ (lovage, ononis, liquorice root, juniper berries, equal parts), styli caustici, sulfonalum, suppositoria, terpinum hydratum, thallinum sulfuricum, tinc. strophanthi (1 : 10), ung. acidi borici (1:10 paraffin ointment), vin. condurango (1:10 sherry wine).

The Latin Grammar of Pharmacy and Medicine. By D. H. Robinson, Ph.D., Professor of Latin Language and Literature, University of Kansas. With an introduction by L. E. Sayre, Ph.G., Professor of Pharmacy in, and Dean of, Department of Pharmacy, University of Kansas. Philadelphia: P. Blakiston, Son & Co. 1890. Pp. 271.

We hasten to note the appearance of this work which has just been published and to which we have thus far been able to give a mere hasty examination, resulting, however, in the conviction that the work is an eminently useful one for the student in pharmacy and in medicine. It is in fact a grammar intended for teaching the Latin language with direct application to the necessities of the physician and pharmacist. The difficulties of such an undertaking are readily appreciated by the philologist, even though they be unknown to, or not valued by, those directly interested. Numerous terms, unknown to classical Latin, have been introduced into science, and such terms—many of them derived from the Greek—have been utilized by the author for teaching the rules of grammar and constructing the exercises for the student. Among these exercises there will be found a large number of formulas and prescriptions taken from Pharmacopœias and from the writings of various authors on medical matters. The vocabularies attached to the work constitute likewise one of its valuable features; in our opinion it would be an improvement to merge the index of suggestive derivations into the Latin-English vocabulary, which contains already quite a number of terms similar in derivation to the former, or which were unknown to classical authors. Perhaps of equal importance to the ancient meaning of the word "populus," given on p. 239, is, to the physician and pharmacist, its botanical meaning as "arbor populi." The admission of ancient terms like iris and abies suggests that others of at least equal importance and antiquity might have been honored in like manner, such as pinus, juniperus, salix, quercus, etc. The extension of the vocabulary in the direction indicated would, in our opinion, materially enhance, to the student, the value of this list even if not extended to make it a medico-pharmaceutical dictionary. In relation to the admission of words, it seems to us, they should be given as established by authority, even if the linguist should have ample reason for dis-

senting; in that case we would have on p. 121 "Pharmacopœa Germanica," and on p. 217 "cimicifuga."

We heartily comment the work for its practical methods and for its general correctness showing the experienced scholar and teacher. Students, as well as those advanced in the two professions, for whose special benefit the work has been elaborated, will appreciate the reliable guide offered to them by the author, and more particularly would we recommend its use to those entering upon the threshold of pharmacy or medicine.

The Monist is the title of a new quarterly magazine of philosophy, science, religion and sociology, to be published in Chicago. Among the contributors are mentioned Prof. E. D. Cope, of Philadelphia; Prof. George J. Romanes, of London; M. Alfred Binet, of Paris; Prof. Ernst Mach, of Prague; Max Dessoir, of Berlin; Dr. Paul Carus, of Chicago; Prof. Joseph Le Conte, Prof. William James, Charles S. Peirce, Prof. Max Müller, Prof. Ernst Häckel, and Th. Ribot.

The foreign correspondence will be furnished for Italy, by Prof. C. Lombroso, the criminologist; for France, by Lucien Arréat, the critic of the *Revue Philosophique;* for the northern countries, by Prof. Harald Höffding, of Copenhagen; for Germany, by Prof. F. Jodl, of Prague, and others.

The magazine will bear a popular character, publishing articles of general interest as well as those of a more special character.

Proceedings of the Seventh Annual Convention of the National Confectioners' Association of the United States, held at Niagara Falls, July 8 and 9, 1890. Official Record of Reports, Circulars and Communications for the year 1889–1890. Philadelphia: Confectioners' Journal Print. Pp. 125.

The pamphlet is about evenly divided between the "Proceedings" and the "Record." As a matter of course much attention is given to reports and laws concerning food adulteration.

VARIETIES.

Potassium iodide has been given by Wolf (*Revue de Thérapeutique*) in doses of from 30 to 50 gm. daily in obstinate cases of tertiary syphilis. It is dissolved in a decoction of rice in order to prevent iodism. The same salt was also given in large doses in a case of psoriasis by Dr. Stenhouse (*Med. Chron.*, August, 1890, p. 410), who administered to a young lady 100 ounces of potassium iodide from March 8 to August 3, the largest doses being 210 grains three times a day. Its influence over the psoriasis did not appear until 360 grains were taken daily.

Poisoning by Male Fern.—The *Wiener Klin. Wochensch.* reports the case of a child 5½ years old, to whom two drachms of the oleo-resin were given in three doses within one hundred minutes. In an hour and a half part of the tapeworm was expelled, then vomiting occurred, and somnolence, followed by twitching, sopor, and trismus, of ten minutes' duration, ending in death five hours after the last dose of the extract.

Salicylic acid has been advantageously employed in dysentery by Cimbali (*Internat. Klin. Rundschau*). It was administered every four hours in doses of 0·5 gm., combined with 0·01 to 0·015 gm. opium.

Atropine as an antagonist to chloroform was recommended many years ago by Albertoni, and his results were recently confirmed by others. Dr. L. Vincini (*Centralbl. f. Klin. Med.*) reports success, only failing after the administration of such large doses of chloroform as to produce coagulation of the heart tissue. As a prophylaxis in chloroform anæsthesia, the subcutaneous injection of 0·002 gm. of atropine is recommended, about one-half that quantity for children, and double the dose in cases of emergency.

The Inefficiency of Sand Filters.—Drs. Fränkel and Piefke, of Berlin, have recently made an exhaustive study on the filtration of drinking-water through sand (*Zeitschrift für Hygiene*, No. 1, 1890). Their experiments conclusively prove that the danger of infection from impure water is only slightly reduced by filtration through sand; bacteria passing through at all times, but in larger numbers just after the filter has been cleaned, and again after it has been in use for some time.—*Med. News*, May 10.

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NOVEMBER, 1890.

PLANT-GROUPS AND THEIR CONSTITUENTS AND PROPERTIES.[1]

By John M. Maisch.

On several occasions, when fulfilling the assigned duty of addressing the students of this College, introductory to the annual courses of lectures, I have discussed questions relating to the origin and the supply of drugs, or referring to physiological processes of plant-life. The study of Materia Medica affords a never-failing source of inquiries into matters of the utmost interest to mankind, which are not confined merely to the identity and quality of a drug, but which involve also commercial and economical questions, and frequently are influenced by, and more or less closely related to, historical events. We are thus led upon a field which is entirely distinct from the pharmaceutical uses and medical application of drugs, and which enlists the interest of the student of general and special history equally well, and sometimes even to a much greater degree, than it does the student of medicine and pharmacy. I need but refer to the discoveries that have resulted from the efforts to find direct communication by sea with the countries where the most valued spices are indigenous; to the changes in the habits of civilized nations occasioned by the introduction and extension of the use of the potato and of coffee and tea; to the influence exerted by Arabian physicians upon the medical armamentarium of Europe; to the events which favored the general use of tobacco in Europe; to

[1] Introductory Lecture to the seventieth course of instruction in the Philadelphia College of Pharmacy, October 1, 1890; published at the request of the Publication Committee.

the causes of scarcity in the supply of senna and gum arabic; to the political complications which were engendered by the cultivation of opium; to the introduction into medical use of cinchona bark; to the changes in commerce and manufacture, as well as in pharmacy and medicine, which are the direct outcome of the cultivation of the cinchonas in the Eastern hemisphere.

The investigations in Materia Medica have supplied the infant Chemistry with a multitude of valuable facts, and helped to nourish that science, until it is now able to repay the debt by furnishing, from its own retorts, many compounds which may take, and to some extent do take, the place of medicines that heretofore were procured only from Nature's bountiful laboratory.

Medicine, that is, Materia Medica, was to a large extent the incentive that led to the study of Botany; and that science, in turn, again leads to the study of the possible uses of plants, or to economic and medical botany. That, apparently, a certain relation exists between the genetic forms or groups of plants and their properties, useful as well as deleterious, was pointed out more than a century ago, after Linné had laid the foundation for the scientific classification of plants. Though subsequently repeatedly denied, such a relation has, in more recent times, been unquestionably established and will doubtless become still more apparent, as continued researches make us more intimately acquainted with the internal structure of a larger number of plants, and with the influence which the various kinds of tissue exert upon the elaboration of the crude material taken up from the soil or imbibed from the atmosphere. The connection alluded to is entirely different from that which in all countries the popular mind has attributed as existing between the external shape of a plant or a plant-part and its curative effects. The traditions of such apparent exemplification of the inherent property by visible and striking characters are still cherished in many localities among different people, and find expression in popular names as well as in medical and botanical terms. The peculiar shape of the three-lobed leaves of a ranunculaceous plant, and of the lobed green and brown thallus of certain acotyledons, in which a resemblance to the liver was fancied, induced the belief into their value for the cure of liver complaints; hence the appellations *hepatica*, and *liverwort*, and equivalent designations in other languages. The Latin *cardiaca* and synonymous terms in French

and German refer to the shape of the leaves and the hold which they were supposed to have upon the heart by means of their divisions. The generic name *Panax* is intended to indicate the value as a panacea attributed to the root from its supposed resemblance to the figure of a man; the same cause for which miraculous virtues were ascribed to the European mandragora root, though neither the Latin name of the latter nor its vernacular synonyms remind us of the high esteem in which it was formerly held as a remedy.

The relation between genetic form and properties, to which I have referred, rests upon more substantial ground than the illogical conclusions deduced from mere physical appearance. It is based upon the axiom that a like cause must produce a like effect; the cause —though at present it can only be conjectured without having adequate proof—will doubtless ultimately be ascertained to operate in the interior fabric of the plant. While in such plants, frequently, the external organs show undoubted evidence of close relationship, these latter do not constitute the moving cause, but are of secondary significance, though they may sometimes embrace all the members identical or at least closely analogous in their internal structure. For these reasons, the groups of plants agreeing, substantially, in their constituents, and hence in their effects, must vary in extent, and cannot be absolutely identical with those groups which by systematic botany have been established under the designation of tribes, families or orders. Several of these latter may sometimes agree in the presence of one important constituent; but more frequently it will be found that one order, particularly if embracing numerous genera and species, may be regarded as forming two or more groups, the members of each having a close family resemblance in the products furnished by them, and, as far as known, in their anatomy.

Starch is a compound generated in nearly all chlorophyll-forming plants, and the storage material, common to by far the largest number of seed-bearing plants, especially to the subterraneous organs of the biennial or perennial herbs. Yet it is almost entirely absent from the extensive order of Compositæ—which alone embraces over 10,000 known species—being replaced by the analogous carbohydrate inulin, and this is also a constituent of Campanulaceæ Lobeliaceæ and one or two botanically allied orders.

Another common storage material is fixed oil, secreted chiefly in the fruit and seed. While rarely, if ever, absent, yet it is very generally known to vary very considerably in amount and in kind; that there are grades of solid and liquid, and of drying and non-drying fats; that, while some seeds are quite oily, yielding the fat readily on even slight pressure, from others the same constituent will have to be extracted by solvents in order to prove its presence. In the case of lycopodium, the presence of a large amount of oil was noticed only after the cell-walls of the spores were torn by trituration with sand or glass.

Let us briefly consider a few groups of plants and their relation to others with regard to constituents produced by them, and hence with regard to their medicinal value.

Among the Acotyledons we meet with the extensive class of Fungi yielding the drug Ergota, the only one of this class generally recognized by pharmacopœial authorities, though somewhat allied fungi—like the cornsmut—possess to some extent analogous properties. While many of the class are edible, like the different mushrooms, morel and truffle, perhaps the largest number is decidedly poisonous, probably in consequence of the presence of one or more alkaloids. These compounds are known only to a limited extent, including those present in ergot, and the muscarine of fly-agaric. It is not improbable that they are chemically related to the ptomaines. A definite compound of apparently valuable medicinal properties, agaricin, has recently attracted attention. It is not positively known whether it exists in other plants than the white agaric, which is also characterized by resinous compounds, met with only to a limited extent in this class of plants.

Of greater economic value are the algæ, more especially those growing in seawater. Though many are locally used as food, their real nutritive value appears to be insignificant. The so-called Irish moss has retained its pharmacopœial position to the present day. Algæ, possessing anthelmintic properties, are used along the Mediterranean, and the bladder-wrack, some years ago, acquired much notoriety as a remedy in obesity. Since iodine is present in the ash of marine algæ, this constituted at one time the only or chief available source for the manufacture of this element. The most important organic constituent is a gelatinizing carbohydrate, which they either contain or else readily form on boiling, and upon which

their supposed nutritive properties depend. Mucilaginous compounds, analogous in composition, are widely distributed among plants; few, if any, being entirely free from such. But occasionally mucilage is met with in abundance as one of the characteristics of phaneragamous plant-groups; for instance, in Malvaceæ, particularly in the mallow tribe proper; in the tuber-bearing orchids, and in the bulb-bearing liliaceæ. We meet with it in the epithelial layer of the seeds of flax, quince, certain salvias, plantagos and of many other plants; we find it in leaves, like benne, senna and buchu; and we observe it as an exudation, most likely caused by internal metamorphosis, upon shrubs and trees of the genus Astragalus, the Mimoseæ, Pruneæ and other groups of the dicotyledons.

Closely allied to these mucilaginous bodies, which are known to be carbohydrates, are others in the composition of which, apparently, less hydrogen is contained, though this still awaits final settlement by renewed researches with the means at present afforded by science. I refer to what are known as *pectin*-compounds and which are met with in sweet and acidulous fruits generally, such as the lemon and orange, the currant and gooseberry, the pear and other pomeæ, the peach and allied pruneæ, the raspberry and blackberry, the pumpkin and melon, the cranberry and huckleberry, and many others. But these pectin bodies have also been found in other parts of plants, and notably in certain biennial and perennial fleshy roots, usually associated with sugar, and, like the latter, constituting most likely a reserve compound in the carrot and parsnip, the turnip, peony, and in the officinal yellow dock, senega and gentian. These amorphous compounds present many difficulties in their purification and liberation from coloring and other principles; yet it is now generally conceded that the metapectic acid of the beet and other plants is in reality identical with arabic acid of gum acacia.

While the algæ grow submersed, the lichens are air plants, usually fastened upon rocks, walls or the bark of woody plants. Some are of industrial value as the source of litmus or cudbear; others are used as food, principally in the arctic regions, and a species of Lecanora has, by some scientists, been regarded as the manna of the Hebrews. The species which have been employed medicinally were regarded as being valuable in pectoral complaints, and of these the so-called Iceland moss still holds its place in the Pharmacopœia.

Its bitter principle, cetraric acid, has been recently employed medicinally; to what extent it is related to the bitter principles of other lichens is not known.

Coloring matters—others than chlorophyll—are formed by all plants with but few exceptions, and are not confined to plants of low organization. Aside from those principles imparting color to flowers and fruit, the chemistry of which is still involved in obscurity, many of the industrially important chromogenes and coloring matters have been investigated to a larger or more limited extent, like indigo and alizarin, and the color-compounds present in or obtainable from logwood, quercitron bark, red saunders, saffron and others; but little or no chemical relation exists between these bodies, and with the exception of indigo and quercitrin they are mostly met with only in one plant, or in a few which are botanically related. However, the yellow crystals of chrysophanic acid yielded by a Parmelia are identical with the same compound prepared from rhubarb or yellow dock of the Polygonaceæ, or from senna and from araroba of the Leguminosæ. To what extent this principle, or such yielding it, may be distributed throughout the vegetable kingdom, must be left to future researches.

The few species of the liver mosses, mosses and equisetums, which were formerly medicinally employed, have long since been discarded from regular practice, and but very little is known of their chemical constituents. Of more than passing interest is the presence, in the species of equisetum, of large amounts of silica, doubtless serving for the purpose of protection. Though the same mineral compound is present in small percentage in the ash of most plants, the equisetums share only with the grasses, sedges and a group of the palms the very general distribution of silica and its relatively large proportion.

In regard to the medicinal properties of the ferns, we meet with a notable distinction between the effects of the foliaceous fronds and those of the rhizomes. In the former, we find mucilaginous principles predominating, and associated with mildly astringent and slightly aromatic qualities; these fern-leaves have, therefore, been used as remedies in pectoral complaints, for which purpose the European and North American species of Adiantum, known as Maidenhair, are still employed. However, the only ferns officinal, according to our and most other Pharmacopœias, are known by our

authority as Aspidium; the rhizome, which is the part used, has the same constituents which are met with in other ferns, varying in proportion in the different species. Fern rhizomes are generally reputed to possess anthelmintic and tænifuge properties, due to the presence of filicic acid or similar compound. Only a small number of ferns are indigenous to the northern hemisphere; the home of most of the nearly 3,000 species of ferns is in damp localities of the tropics, where quite a number assume a tree-like aspect, attain a height, sometimes, of fifty or sixty feet, and in habit resemble a stately palm. A handsome Cyathea and others have a farinaceous tissue which is used as food and establishes a resemblance with the sago palms, independently of the general habit. The astringency, which is observed in some degree in the male fern, becomes so strong in some species that they may be used for tanning. In fact, among the cryptogamous plants, only those having vascular tissue contain tannin, and the ferns are the only group in which notable quantities of it are met with. This compound—or rather class of compounds—is more generally diffused among phanerogamous plants, where different kinds appear to be most largely found in the leaves, in the bark of trees, in rhizomes, in some perennial roots, and in such morbid excrescences like galls.

The gymnospermous plants, to which class the pines belong, though numerous as regards individuals, comprise only about 450 species, two-thirds of which are coniferous. The latter are characterized by the production of volatile oils, many of them being hydrocarbons, and by the secretion of resins. Both these classes of compounds, as we have seen, occur only to a very limited extent in the cryptogamæ. But volatile oils and allied aromatic compounds are met with, to some extent at least, in most phænogamous orders. They are produced in certain groups of the grasses, orchids and lillies of the monocotyledons, and likewise in certain genera or species of the violets, geraniums, leguminosæ, rosaceæ, compositæ and others, while these principles very generally pervade the scitamineæ, laurels, labiatæ, umbelliferæ, the myrtles, oranges and other groups. A peculiar variety of volatile oils, containing sulphur, imparts a unique pungency to the cruciferous and some allied plants; and similar in composition, though different in scent, are the volatile oils of the alliums and of certain umbelliferæ, of which the asafetida plants are representatives.

Resins are likewise widely distributed throughout the phanerogams, and but few of these plants appear to be destitute of such compounds. Very frequently they are associated with volatile oils, or with gum, or with both; in the two last-named cases they usually form milky exudations, from which the officinal gum resins are obtained.

Saponin has received its name from a plant of the caryophyllaceæ, in which order it appears to be of frequent occurrence; but it or an allied compound has also been shown in the polygalaceæ, in the rosaceous quillaia, in the smilaceæ and other plant-groups, while volatile acrid compounds exist in many aroideæ, in buttercups and their immediate relatives. Somewhat allied to the saponins are certain powerful poisons of the liliaceæ, primulaceæ and of digitalis and other scrophulariaceæ.

The aroideous calamus owes its medicinal virtues to a volatile oil and bitter principle, types of compounds which are frequently associated in the bitter-tonic drugs. But others, like the simarubaceæ and gentianaceæ, have developed the bitter principle to the total or almost complete exclusion of aromatic and astringent compounds.

Many of the principles referred to belong to the class of glucosides, so called because upon decomposition under certain influences glucose or an allied carbohydrate makes its appearance as one product. A peculiar group of the same class should be mentioned here, apparently confined to the convolvulaceæ, like jalap and scammony, which owe their cathartic action to so-called resins, in reality, to water-insoluble anhydrides of water-soluble acids, both splitting into compounds, one of which is sugar.

The bitter taste is not solely confined to the glucosides and so-called neutral compounds. A very large number of the most important class of alkaloids share with the former this property. It is now nearly three-quarters of a century that the first alkaloid, morphine, has been announced as a basylous organic compound; to-day the members of this class, both natural and artificial, are almost innumerable. Among the acotyledons it is almost exclusively the class of fungi which in its different groups produces alkaloids, quite distinct, as a rule, in composition and effect, from those generated within the living tissue of phænogams. Such alkaloids are in nearly all cases confined to a single species, or genus, or tribe, and only in rare cases have been met with in several orders. Thus,

berberine exists in plants of the ranunculaceæ, anonaceæ, menispermaceæ, berberidaceæ, rutaceæ and leguminosæ; and caffeine in the orders of rubiaceæ (coffee), ternstroemiaceæ (tea), sapindaceæ (guarana), sterculiaceæ (cola and cacao) and in ilicineæ (maté, etc.). But colchicine has only been observed in colchicum; veratrine and jervine in veratrum; piperine in certain peppers; quinine and allied alkaloids in cinchona and remijia; strychnine and brucine in strychnos; morphine and congeners in opium, and one or two of these compounds also in other poppies; sanguinarine in a few papaveraceæ; pilocarpine, physostigmine and cocaine, each only in a single species; aconitine and its near relatives in several aconites; nicotine in species of tobacco, etc. A most interesting group are the mydriatic alkaloids of the solanaceæ, which are widely distributed throughout this order, are very similar or identical in elementary composition, and may, in part at least, be converted one into the other.

I have dwelled upon a few only of the relations between plants and their constituents and properties, and have merely hinted at some of the structural causes. Enough has been said, I trust, to show the intense interest attached to the questions involved. As we proceed with the work beginning this evening, we shall have frequent occasions to note some facts of the kind spoken of, and it has been my object to enlist, in advance, your earnest attention to their importance—important to the pharmacist and to the physician, and not less so to the student, both junior and senior.

ANTISEPTIC MATERIALS.

By Joseph W. England, Ph.G.

Read at the Pharmaceutical Meeting, before the Philadelphia College of Pharmacy, Oct. 21.

With the advent of antiseptic surgery, there has arisen a demand for certain new products in the form of medicated solutions, gauzes, cottons, etc., necessary for the successful prosecution of that form of treatment.

It is to be regretted that the preparation of these products, owing to their comparatively limited demand in the past, has fallen almost entirely into the hands of special manufacturers, when, by their preparation, a perfectly legitimate source of revenue could be added to the pharmacist's fast diminishing list. Their preparation requires no special machinery nor demands any special skill, save only the

exercise of absolute chemical cleanliness, and it is more than probable that, if physicians were made aware that all such appliances could be had of the pharmacist, made fresh and just as desired, their use would rapidly extend; resulting in a triple benefit to patient, physician and pharmacist.

Certain it is that antisepsis has come to stay. As a rational, scientific method of surgical treatment it has passed the experimental stage and amply proven its worth, and pharmacists, with but little trouble, could now establish a healthy demand for antiseptic materials.

It may not be amiss to here call attention to the composition of the various antiseptic solutions at present used. Corrosive sublimate, in various strength solutions, of from *1* part in *1,000* parts to *1* part in *5,000* parts of water, is most largely employed. Dr. C. M. Wilson's solution is *1* part, each, of mercuric chloride and ammonium chloride (or the old Sal Alembroth) in *1,000* parts of water. It has been shown that gauzes and cottons made with this solution do not reduce the soluble, active, mercuric chloride into the insoluble, germicidally-inactive mercurous chloride or calomel, as is the case when mercuric chloride is used alone. Carbolic acid, especially the "$\frac{1}{20}$" solution, is still used quite largely, but more especially as a disinfectant and not as a germicide. Benzoic and salicylic acids, in the form of solutions, are now but rarely used. Boric acid, however, is developing strong popularity and is extensively employed in bed-sores, ulcers, inflammations, etc., and especially in ophthalmic practice (*10–18* grains to each fluid ounce of water).

Dr. La Place's tartacid sublimate solution is a solution of *1* part of mercuric chloride and *5* parts of tartaric acid in *2,000* parts of water. Dr. La Place was led to advocate the addition of tartaric and, because he found that unless free acid be present, the mercury was precipitated as an insoluble, mercuric albuminate, upon coming in contact with blood serum. He informs the writer that he first suggested tartaric acid because of its convenience, but has since found that hydrochloric acid will answer equally as well, if not better. In his wards he uses the following formula:

Mercuric chloride, *1* troy ounce. Hydrochloric acid, *5* fluid ounces. Water, a sufficient quantity to make *8* fluid ounces. Dissolve. *1* fluid drachm to the pint equals $\frac{1}{1000}$ of mercuric chloride.

A criticism reported on this combination is that the large propor-

tion of hydrochloric acid gives the solutions an irritating or slightly escharotic action, and causes considerable pain. This charge is also made upon the tartaric acid solution, though in the latter case the irritation is said to be much less.

It may be of value to know that the universal use of acids in germicidal solutions is strongly objected to by some physicians. It is claimed that acids are only desirable where false tissues, indolent ulcers and deep-seated abscesses exist, and, though mercuric chloride may form at first an insoluble albuminate upon contact with blood serum, such a precipitate or film does not thereafter affect its germicidal action. It is of interest, in this connection, to note that, according to Mr. Martindale,[1] mercuric albuminate is soluble in an excess of albumen, so that after the dressing has been applied the filmy precipitate is probably dissolved away by exuding blood serum.

Pana's antiseptic solution, used only in ophthalmic practice, is made with $\frac{1}{8}$ gr. of mercuric iodide, *60* m. of alcohol and *5* $\frac{1}{2}$ fl. oz. of water. Dr. Conrad Beren's silico-fluoride tablets are composed, each, of sodium silico-fluoride, *1* gr.; hydrastine hydrochlorate, $\frac{1}{12}$ gr.; sodium bicarbonate, *3* gr.; sodium biborate, *2* gr.; eucalyptol, $\frac{1}{4}$ m. For using, one tablet is dissolved in four fluid ounces of water. Dr. Carl Seiler's alkaline antiseptic tablets are made, each, of sodium bicarbonate, *3* $\frac{3}{4}$ gr.; sodium biborate, *3* $\frac{3}{4}$ gr.; sodium benzoate, $\frac{1}{6}$ gr.; sodium salicylate, $\frac{1}{16}$ gr.; eucalyptol, $\frac{1}{6}$ gr.; thymol, $\frac{1}{6}$ gr.; menthol, $\frac{1}{26}$ gr.; and oil of gaultheria, $\frac{1}{22}$ gtt. To use, one tablet is to be dissolved in two fluid ounces of water.[2]

An antiseptic solution much used in the Philadelphia Hospital, as an addition to gargles, washes and lotions, etc., is the following solution, prescribed under the name of "Liquid Antisepticus:" Menthol, 3 gr.; thymol, 8 gr.; boric acid, 30 gr.; sodium benzoate, 45 gr.; sodium salicylate, 45 gr.; oil of gaultheria, 6 gtt.; oil of eucalyptus, 18 gtt.; glycerin, 4 fl. dr.; alcohol, 2 fl. oz.; water, a sufficient quantity to make 6 fl. oz. Mix. Use largely diluted with water. A marked peculiarity of this antiseptic solution is the fact that, though at first it becomes opalescent on the addition of water

[1] A. J. P., 1885, p. 520.

[2] The original solution of Dr. Seiler's contained, also, in each two fluid ounces, *32* minims of glycerin and *5* minims of alcohol, but in the tablet these have, of necessity, been dispensed with.

from precipitation of the oils, yet, on the further addition of water, it again becomes transparent.

An antiseptic which of late has attracted much attention is that first introduced by Dr. E. P. Bernardy (1886), of this city. It is a solution of mercuric iodide (*1* part) with sufficient potassium iodide to dissolve. Theoretically, it would require about three-fourths of the quantity of the mercurial salt used, but in practice he uses equal parts, so as to prevent the possibility of subsequent precipitation of mercuric iodide on further dilution with water.

It is claimed that $\frac{1}{4000}$ solution of this compound is equivalent in germicidal strength to a $\frac{1}{2000}$ solution of mercuric chloride, and experiments made by Bernardy, Krassowski and others would seem to justify the claim. Further, Dr. Bernardy informs the writer that in his experiments he found, with a $\frac{1}{4000}$ solution, no precipitation, upon adding it to blood serum, and Mr. Listed states that red mercuric iodide is freely soluble in 200 parts of blood serum and remains most actively antiseptic.

One drawback to its more general employment is its ineligibility. Mercuric iodide and potassium iodide cannot be compressed together in tablet form on account of the deliquescent nature of the combination, and it is not advisable to add, as has been sometimes done to obviate that result, ammonium chloride, for fear of ultimate conversion of the mercuric iodide into mercuric chloride and ammonium iodide. The best way would seem to be to compress separate tablets of *3½* grains, and, on using, dissolve, one of each, in a small quantity of water first, and then add the balance of water to make the quart.

In introducing this antiseptic, the chemical error has been made of calling it "biniodide of mercury." It is nothing of the sort. By chemical addition, a very deliquescent and entirely different compound is formed, namely, potassio-mercuric iodide ($2\ KI.\ HgI_2$).

We, as pharmacists, know what a strongly decomposing influence this solution, in the form of "Mayer's Reagent," has upon alkaloidal solutions—even greater than a solution of mercuric chloride, and a possible explanation of the high germicidal value of potassio-mercuric iodide may be found in that fact, with also Dr. Van Arsdale's (Annals of Surgery) explanation of the antiseptic action of iodoform, remembering that ptomaines are, in a strictly chemical sense, alkaloids. He says that "the germicide power of iodoform

was long supposed to be the secret of its value in the treatment of wounds, but recently it has been conclusively proven that as a germicide it is feeble and acts within narrow limits. Further investigation into its mode of action has elicited that it is a chemical antidote to the ptomaines. The ptomaines, the product of the bacteria, are exceedingly devitalizing to the tissues, and their destruction by the iodoform enables the tissues to destroy the germs or resist their malign assaults. In dressing wounds, the surgeon must hereafter use two different sets of antiseptics. He must first seek, as far as possible, to exclude disease germs or to render them inactive, and for this purpose he must use germicides, such as corrosive sublimate. He must next endeavor, by applying agents like iodoform, to prevent formation of poisonous chemical substances in the wound, or to decompose them and render them inactive if once they have been formed."

In the writer's experience, the demand for oakum and jute has almost ceased; absorbent cotton being used instead. Lint is, comparatively, but little used, while borated, carbolated and salicylated cottons are but semi-occasionally called for. Out of the large number of medicated cottons that have been introduced, there is now in strong and active demand but one, namely, corrosive sublimated, or "sublimated," cotton, and the demand is constantly increasing both for it and absorbent cotton.

For the preparation of sublimated cotton, the following formula is recommended:

Mercuric chloride,	35 gr.
Ammonium chloride,	35 gr.
Alcohol,	1 pint.
Boiled water,	4 pints.
Absorbent cotton,	1 pound (av.)

Dissolve the sublimate in the alcohol, add the boiled water containing the ammonium chloride dissolved in it, immerse the cotton, kneading thoroughly, so as to have the antiseptic solution uniformly distributed through it and so that none of the liquid be left. Dry.

The product, when dry, contains one-half of one per cent. of mercuric chloride, in a form not reducible to mercurous chloride by the organic cotton, as occurs after a time, when the corrosive chloride alone is used.

By far the most important of the antiseptic dressings are the

gauzes, especially those impregnated with mercuric chloride and with iodoform; the others, carbolated, naphthalinated and eucalyptol, are in very light demand.

There exists, at present, considerable differences of opinion amongst physicians as to the relative values of "moist" and "dry" gauzes. By the term "moist" gauze is here meant gauzes which are kept permanently moist with alcohol and glycerin. On the one side, it is claimed that moist gauzes are better than dry gauzes, because they contain the antiseptic in the most active form, namely, a soluble form; while, on the other hand, many physicians prefer to use the dry gauzes, either applied dry, as practised by Prof. Keen, or immersed, as is usually done, in the antiseptic solution just before applying, or, if the demand warrants it, as in hospital wards, keeping it in museum jars filled with the antiseptic liquid, preferably of mercuric chloride and ammonium chloride, and removing on using.

As has been before said, there exists a wide divergence of medical opinion concerning the subject of gauzes, and it may be a matter of information to here present some of the arguments used. First, it is urged that if the statement be true that antiseptic gauze is only active when it is moist, it would seem to be also true that "moist" gauze, being active, is constantly undergoing progressive deterioration of germicidal strength; because, accepting the modern teachings as to the omnipresence of disease germs, no container could be kept sufficiently tight to exclude them, and as the containers are frequently opened, the germs of the air are repeatedly coming in contact with it, and, as fast as one colony is destroyed, another takes its place, until the entire germicidal power of the gauze becomes in time nil; whereas, the dry gauze (in which ammonium chloride is present) is a product of constant strength, which, though inactive when dry, becomes actively antiseptic on coming in contact with moisture exuding from wounds. Hence, on application of a moist gauze to a wound without previous immersion, there is no positive guarantee that the gauze may not contain disease germs; while, if the moist gauze be first immersed before applying, wherein exists any superior advantages in its use?

Then, on the other hand, concerning the use of a dry dressing, immersed in antiseptic solution and applied, it is said that, while it is undoubtedly antiseptic, the moist condition has several disad-

vantages. It interferes with the evaporation of the wound secretions; it has a tendency to devitalize the tissues by inducing osmosis, with their contained blood serum, and it is inclined to cause eczema. (See White, Univ. Med. Mag., 1889, 208.)

The tendency of the times seems strongly in favor of following Prof. Keen in his use of dry sublimated dressings, without any previous immersion, who claims to have obtained very superior results with such a method.

For the preparation of iodoform gauze, the following formula is used:

Iodoform,	5 oz. av.
Petroleum benzin,	18 pints.
Purified gauze,	100 oz. av. (about 54 yds.)

Dissolve the iodoform in the benzin, hang the gauze upon an antiseptic clothes-line, in a clean, dry room remote from fire, then saturate the gauze with the benzin solution. When dry, moisten with a mixture of alcohol (2 parts) and glycerin (1 part); cut it into 3-yard pieces. After the alcohol has largely evaporated wrap in paraffine paper with antiseptically clean hands and keep in a closed container, having in it an open salt mouthed bottle containing water (to keep it moist).

The finished product contains 5 per cent. of iodoform. As a solvent, petroleum benzin possesses a number of advantages which make it superior to ether. It evaporates less rapidly and dissolves the iodoform, without decomposition, to form a clear solution, while commercial ethers, even the best, partially decompose the iodoform to set free iodine; forming a light red solution.

The gauze is previously purified in the following way: Boil 100 oz. av. of gauze, or common cheese-cloth, in a tin boiler, having a perforated false bottom, for two or three hours, with 6 gallons of water having had dissolved in it: powdered borax, 8 oz. av. and sodium carbonate, 32 oz. av. Remove, while hot, to a tub containing 2 gallons of solution of chlorinated soda; wring out in this solution, and wash well in not less than three clean waters. Then pass through the wringer, dry, and it is ready for further treatment.

The borax is directed to dissolve the glue, used by manufacturers to stiffen the cheese-cloth, while the washing soda is employed to saponify the fat and dissolve the resin naturally present.

It sometimes becomes necessary to make the iodoform gauze 10, and even 25 per cent. in strength, in which case the benzin method cannot be used, and recourse is then had to the older method of Weir, of iodoform and soap-suds, modified by the omission of mercuric chloride, which, as White has pointed out, results in mutual decomposition of the mercuric chloride and the soap. To use this method, take the iodoform and mix it with ordinary castile soap-suds in the proportion of about 1 to 15; pour this mixture over the purified gauze and distribute it evenly through the meshes by rubbing. When dry, wrap in paraffin-paper.

Dr. La Place, however, prefers to use a pastry mixture of iodoform, ether, alcohol and glycerin to spread over the gauze and exposed to the air until all the alcohol and ether have volatilized.

To make sublimated gauze the following formula is used:

Mercuric chloride,	21½ gr.
Ammonium chloride,	21½ gr.
Boiled water,	6 pints.
Purified gauze,	100 oz. av. (about 54 yds.)

Dissolve the chlorides in the water, immerse the gauze, previously cut into pieces of 3 yards ("short") or 6 yards ("long"), each, in length. Express moderately, or so that no liquid shall be left. Dry in a clean, dry room, upon an antiseptic clothes-line. Remove, wrap in paraffin-paper and keep in a well-closed container. It is, perhaps, needless to say that in all these operations the hands should be kept germicidally clean with "bichloride" solution.

The product contains $\frac{1}{20}$ of one per cent. of the active ingredient. The package should never be opened until about to be used, and then only by the physician, and who uses it either dry or immerses it in the mercurial solution, before applying to the wound.

To protect the edges of the wound from irritation by the antiseptic used, it is usual to employ a piece of oiled silk, coated with copal varnish, and dusted with powdered dextrine (1 part), powdered starch (2 parts) and "$\frac{1}{20}$" carbolic acid solution (16 parts). This is the so-called "Lister-protective." The dextrine and starch are used to give the varnished silk a surface, which will allow a film of water to evenly spread itself over it. It is applied along the entire length of the wound, leaving free the ends from which the drainage tube or catgut protrudes.

To purify sponges, the method given in the National Formulary (p. 121), for bleaching sponges, is followed, with some important modification in details.

After freeing the sponges from sand and any other obvious impurities or damaged portions by beating, washing and trimming, they should be macerated for 12 hours in a solution of hydrochloric acid (8 fl. oz.) and water (1 gallon), to remove lime salts. Then, wash thoroughly with water to remove excess of acid. Next, macerate in a solution of potassium permanganate (240 gr.) in water (1 gallon), wringing them occasionally and replacing it in the liquid, until they become, ONLY, a very light brown color. (Excessive oxidation rots the sponge). Remove, wash well with water, until the latter runs off colorless. Then place in a solution of sodium thiosulphate (hyposulphite) (8 oz. av.) in water (7½ pt.) and add hydrochloric acid (8 fl. oz.), macerate, expressing frequently and replacing in the liquid, until they are sufficiently light in color. Remove, wash well with water to remove every particle of sulphuric and sulphurous acid and store in dry containers.

Prof. Perkins[1] employs sodium bisulphite in place of sodium thiosulphate, in which case no free sulphur is precipitated, but this appears to be an expensive and unnecessary refinement, since precipitated sulphur is readily removed by washing.

For arresting hemorrhages physicians, employ a ligature of either silk (which is but little used), or catgut, the inner media of sheep's intestines. The gut must be perfectly antiseptic, so that it can be left in the wound with a surety that it will be absorbed without septic poisoning. For the purification of commercial guts, which come in five sizes, a, b, c, d, e, or 1, 2, 3, 4, 5, from the finest made to the largest cello string, and which can be procured from importers, wholesale dealers in musical or butcher supplies, the writer follows the method of Lister, modified by Prof. Samuel Gross, as yielding the most satisfactory results. It is: Macerate in stronger ether for 24 hours. Remove, place in a $\frac{1}{1000}$ mercuric chloride solution, one-fifth part by weight of which is alcohol, the rest water, and macerate for 30 minutes; remove, cut into pieces of three or six feet each, dry and place in oil of juniper, to macerate for ten days, after which time it is ready for use, or may be kept indefinitely. To use, remove, wipe off adhering oil with an antiseptic towel, or, better,

[1] West. Druggist, Sept., 15, 1890.

wash with benzin, dry and keep in the $\frac{1}{1000}$ mercuric chloride solution above mentioned.

In some cases, where it is desired that the gut be longer than from five to ten days in being absorbed, as is the case with plain catgut rendered antiseptic, it becomes necessary to chromicize it, when it will resist absorption in from ten days to three weeks. This is done as follows:

Macerate the gut (200 gr.) in stronger ether for 48 hours, remove, dry, cut into 3-foot pieces, and twist on a glass spool, not more than two threads deep, to prevent curling and place in a "$\frac{1}{20}$" carbolic acid solution (10 fl. oz.), which has had added to it chromic acid (1 gr.) (containing no free sulphuric acid); macerate for 48 hours, by which time the color of the solution changes from orange to very light yellow. Remove, dry and place in an air-tight jar, which has been previously antisepticized with a $\frac{1}{1000}$ mercuric chloride solution and dried.

This product will keep for two or three months. To use, immerse for a short time in a $\frac{1}{1000}$ mercuric chloride solution.

In conclusion, there is one subject which, though it does not belong to the class of antiseptic materials, is worthy of notice, because it is very often used in connection therewith, and that is ether. In medicine, practically, ether is almost wholly used as an anesthetic, and, in the writer's opinion, the U. S. Pharmacopœia errs in having two ethers officinal, or in not stating in the text which of the two should be used as an anesthetic. The very wide difference between the several amounts of each required under similar conditions to produce unconsciousness reported by physicians, can be readily understood when it is stated that Æther contains about 26 per cent. of alcohol (probably about 5 per cent. of which is water), while Æther Fortior contains about 6 per cent of alcohol (with a little water). Even with this latter, it is difficult in some cases to produce ready anesthesia, and it would seem to be far wiser to have only one strength, and that a higher one (which can be had in the markets and for which there is now most unquestionably a strong demand), and dismiss the two older and weaker strengths.

Concerning the pharmaceutical preparations which contain it, such as collodion and the simple and compound spirit of ether, it would be a very easy matter to reduce the quantity of ether contained in them and make up the difference in strength with alcohol.

SOME AMERICAN GALLS.

By Henry Trimble.

Contribution from the Chemical Laboratory of the Philadelphia College of Pharmacy.—No. 78.

Read at the Pharmaceutical Meeting, October 21.

During the past summer a number of galls were obtained from the oaks and sumacs in the vicinity of Philadelphia. During July a sample was collected from the leaves of young white oaks, *Quercus alba*. They were about the size of a pea and characterized by a covering of purple spines. They were identified by Mr. L. O. Howard, acting entomologist in the U. S. Department of Agriculture, as having been produced by the insect *Acraspis erinacei*. They were submitted to a partial analysis at once and found to contain 17·89 per cent. of tannin. This was the mean of three closely agreeing determinations by the gelatin and alum process. The moisture was found to be 45·95 per cent., and ash, 0·60 per cent. In order to compare the amount of tannin and ash with some further work on the subject, the following figures representing the amount of each in the absolutely dry substance are given—tannin, 32·10 per cent.; ash, 1·11 per cent.

Another gall very common in this vicinity is found on the twigs of the white oak. They are round, smooth, of a waxy lustre, and much resemble very small apples, but they are not quite so large as the Turkish galls. A large number of these were collected in August, and identified by Mr. Howard as "a *Dipterous* gall, made by some species of *Cecidomyia* or *Diplosis*." They were found to contain 73·19 per cent. of moisture, 0·46 per cent. of ash, and as an average of three determinations 9·34 per cent. of tannin. This corresponded to 34·83 per cent. tannin and 1·71 per cent. ash in the absolutely dry galls. Some experience with these galls in previous years had led me to a knowledge of the fact that when they were collected and allowed to air dry slowly, they rapidly deteriorated in tannin strength. It was on this account that all of the galls above mentioned were assayed as soon as collected, although one lot was rapidly dried at a temperature of 100°, and then set aside for some weeks, when they were found to contain the same percentage of tannin, when calculated for absolutely dry material, as those just mentioned, and a number of them were finely powdered

and submitted to the action of the various plant solvents in succession, with the following results:

	Per Cent.
Soluble in petroleum ether,	0·84
" stronger ether,	1·10
" absolute alcohol,	21·32
" water,	34·90
" dilute soda solution,	12·36
" dilute hydrochloric acid,	3·02
Moisture,	7·00
Ash,	1·80
Cellulose and lignin,	17·41
	99·75

The absolute alcohol extract was composed of 7·56 per cent. tannin, 6·77 per cent. glucose, 5·75 per cent. phlobaphene and 1·24 per cent. undetermined. The aqueous extract was made up of 23·76 per cent. tannin, 7·88 per cent. glucose, 0·71 per cent. saccharose and 2·55 per cent. mucilage.

The tannin of these galls was investigated and found in many particulars to resemble gallotannic acid, but there were several points of difference, so that more material must be obtained and the experiments repeated before the results can be offered for publication.

Another gall was also collected in August from the leaves of *Quercus palustris*, pin oak, and stated by Mr. Howard to have been produced by *Holcaspis globulus*, Fitch. They yielded when fresh 3·91 per cent. of tannin, 0·77 per cent. ash and 58·73 per cent. moisture. This when calculated without moisture shows 9·49 per cent. tannin and 1·87 per cent. ash. This tannin differed in many ways from gallotannic acid, but further statements concerning it are likewise reserved for the present.

About the same time the above were collected, a few galls were found on the leaves of *Rhus glabra*, but the insect producing them was not identified. Unlike the oak galls, they were hollow, and in many other respects they resembled the commercial Chinese galls. They were somewhat pear-shaped, nearly as large as the Chinese variety, but were externally of a greenish color, and became brown on drying.

They were not assayed until they had become air dry, and were then found to contain 61·70 per cent. of tannin, 2·04 per cent. of

ash and 12·93 per cent. of moisture, or for the absolutely dry material, 70·90 per cent. of tannin and 2·34 per cent. of ash.

The tannin of these galls was not further investigated for the want of sufficient material, since all of those collected were found on one bush, and an extensive search over a considerable section of country and among a large number of shrubs failed to yield any more.

I am indebted to my assistant, Mr. J. C. Peacock, for the chemical work, since, without his help, the galls could not have been so promptly assayed in the fresh condition.

THE PROSPECTIVE CAMPHOR INDUSTRY OF FLORIDA.

By John M. Maisch.

Read at the Pharmaceutical Meeting of the Philadelphia College of Pharmacy, Oct. 21.

The daily papers have recently referred to experiments carried on in Florida with the view of introducing there the production of camphor. Messrs. A. J. Beach & Son, nurserymen, at Palatka, Fla., have, for several years past, paid attention to the culture of the tree, and during the present autumn produced some camphor. Dr. Chas. A. Heinitsh, Lancaster, Pa., has been in correspondence with the firm named, and has kindly placed at my disposal several letters, from which the following information is gleaned, that appears to be of general interest.

The camphor tree grows in Florida in almost any kind of soil, is in a growing condition for about nine months during the year, and is not affected by cold weather. After two or three years, it will grow with little or no care, and even in the poorest land was found to have produced at twelve years a trunk 14 inches in diameter. Another tree, ten years old, had grown two trunks, each 10 feet high and 12 inches in diameter, the total height of the tree being between 35 and 40 feet.

It is apparent from these statements that the camphor tree is of rapid growth. When between four and five years old, it has attained a height of 10 feet and a trunk diameter of 4 inches. From some trees of this size Messrs. Beach cut branches about one inch thick at the base, and with the leaves, subjected them to distillation, the wood and every other part of the tree being rich in camphor. Using an improvised still, the yield from 13 lbs. of branches was a common

teacupful of crude camphor; but it is estimated that about one-half of the product was lost in distillation. The still consisted of a common iron kettle, holding 10 gallons, to which was fitted a wooden cover plastered over with clay, and this was connected with a one-inch galvanized pipe. The kettle was charged with the camphor branches and a small quantity of water, and the distillate was collected in a five-gallon cracker can; the condensed oil, by reducing the temperature, separated the camphor. It is claimed that if cultivated on a sufficiently extensive scale the camphor tree would yield much larger profit in Florida than any other product of the soil. In addition to this, it should be noted that the camphor tree is an evergreen of handsome appearance, and hardy in that climate; that it is not eaten by cattle and other stock, and that in a few years it does not require the protection of a fence, being then strong enough not to be broken down by cattle. It flourishes in almost any soil like the native pine and oak; is not attacked by insects, no loss occurs by the dropping or stealing of fruit; and every part of the tree can be utilized. Messrs. Beach think that in ten years more camphor trees will be growing in Florida than orange trees, and that this industry will prove to be more profitable than the production of sugar. At the present time the price for yearlings is from 25 to 50 cents, and for older trees proportionately more.

From their experience thus far gained, they outline the treatment of camphor trees as follows: At the age of four or five years the first cutting is made for distillation by pruning from the ground to the height at which the head of the tree is to be retained. From that time on, the head is sheared in a suitable manner, without neglecting the pruning from the ground up, with the view of making the head larger. With this treatment, distillation is carried on every year, and in twelve or fifteen years the trunk of the tree will then have attained a sufficient size to be sawn into lumber, so that the valuable camphor wood may also be utilized. The trees being set 15 feet apart, the stumps may be allowed to produce shoots until young trees have been raised and are sufficiently advanced to take the place of the old ones, when the stumps are uprooted and subjected to distillation. It will be seen that nothing goes to waste.

It should be stated yet that the claim of the newspapers of the greater strength of the camphor produced in Florida, as compared with the imported camphor, is erroneous. The specimen here

shown has an odor differing from that ordinarily observed in commercial camphor, the odor of safrol being distinctly recognizable. After the complete separation of the volatile oil with which the camphor is still impregnated to some extent, the properties of the latter, including odor and composition, will doubtless be identical with the corresponding properties of the camphor imported from China and Japan.

THE INDIAN OPIUM TRADE.

By P. L. Simmonds, F.L.S.

Nothwithstanding the alleged prohibitory regulations and the heavy import duty of more than £26 per chest, the consumption of opium in China continues, and the native culture of the poppy is fast becoming extensive.

The 400 million population of the Empire, and those in the Malay Peninsula and other countries of the East, seem to use a great deal of the drug, which is in as large a use as the tobacco leaf in the West.

The opium revenue, after that on land, has hitherto been the most important source of Indian revenue. This is, however, now on the decline.

The total annual revenue derived by the Indian Government two years ago used to be nearly £10,500,000, the Excise opium bringing in under £1,000,000, and the "provision" opium, or that sent to China and the East, the rest. The net revenue has now declined by over £2,500,000.

About 40,000 chests of opium are produced in the native States of Central India, Rajputana and Baroda, which pays a duty on entering British territory, for export from Bombay, but the bulk of the opium is produced in the Bengal Presidency.

The cultivation of the poppy and the manufacture of opium in Bengal are Government monopolies. Though the poppy grows freely in most parts of India, its cultivation in British territory is confined to a tract in the Ganges Valley, 600 by 200 miles in extent, and is strictly prohibited elsewhere. The opium is prepared at the Government agencies at Patna and Ghazipur. The "provision" opium, or that which is intended for export, is then sent to Calcutta, where it is sold by auction at monthly sales. To prevent specula-

tion and to steady prices, the quantity to be sold during the year is duly notified in the previous year.

The following figures indicate the decline in the exports and the countries to which the opium is sent:

	1880—cwt.	1890—cwt.
To Hong Kong,	83,055	76,493
Treaty ports,	46,046	19,997
Cochin China,	—	1,541
Straity settlements,	15,417	20,185
Other countries,	120	383
	144,638	118,599

In view of the steady fall in price of recent years, it is, perhaps, not too much to say that as Indian opium has to a material extent lost its character of a monopoly, having to compete with Chinese opium and that of Persia and other countries, it has followed all other commodities in their relation to gold. China pays for opium with gold, tea and silk, and the value of gold having risen, while the value of tea and silk has fallen in the European markets in relation to gold, it follows that the opium for which they pay must fall, too, unless it is substantially a monopoly in the hands of the Indian producers. This it no longer is, and it is probable that it may fall still further in value and remain permanently at a lower level, unless and until a change is effected in the present state of the currency of the world. In 1881, the chest of opium (which weighs 140 pounds) fetched £185 but it gradually dropped to £111; rather better prices were, however, obtained last year.

The cultivation of the poppy in China has increased enormously, and the quality of the drug has, at the same time, improved. The foreign drug, which has been and still is, though to a lesser degree, preferred, on account of its superiority, has become dearer under the operation of the opium clauses of the Chifoo Convention of 1831, with the result that the native opium is coming into more general use. The country-grown opium, which generally evades duty, is, moreover, cultivated and prepared at less cost; has therefore a distinct advantage over the carefully-prepared and heavily-taxed foreign drug.

The bulk of the exported Indian opium finds its way to China, but the increased cultivation in the Empire itself has caused a considerable decrease in the consignments, both to Hong Kong and to the

Treaty ports. The decrease to China in the last ten years seems to have been as much as 33,000 cwt. Persian opium has also increased greatly in recent years, and, being cheaper than the Indian article, has begun to have a distinct effect upon the market. The foreign exports from India by no means represent the total trade in the drug. There is an immense internal consumption of what is known as Excise opium, averaging about 4,500 chests yearly, weighing about 5,600 cwt. This is retailed to the Indian consumer as a decoction, or in the form of two smoking mixtures known as Chandu and Madak.

OPIUM EXPORTS FROM INDIA IN THE FINANCIAL YEARS ENDING MARCH.

	Chests.	Cwt.
1878,	92,820	126,789
1879,	91,200	125,765
1880,	105,507	144,638
1881,	92,190	127,484
1882,	89,338	123,846
1883,	91,798	126,789
1884,	91,963	126,585
1885,	86,578	118,599
1886,	87,956	120,995
1887,	95,839	131,630
1888,	90,096	125,870
1889,	87,789	122,160
1890,	85,166	118,598

The quantities of the different kinds of opium imported in 1889 into China, added to that held in bond from the previous year, were as follows, in piculs of about 1 1/4 cwt.:

	Piculs.
Malwa,	36,200
Patna,	26,165
Benares,	18,177
Persian,	3,414
Turkey,	2,414
	86,370

The net imports into China were—

	Piculs.
1888,	82,401
1889,	76,040

The home production is believed now to be as much as that imported, and this would give a total of about 200,000 cwt. As 5 drachms is the calculated average amount used by each smoker daily, the consumption, instead of being general, must be limited to

but a few millions of the population, who consume the 22½ million pounds.

The import of opium into the United Kingdom has been declining the last few years. In 1885, the imports were 710,100 lbs.; in 1889, they had dropped to 492,115 lbs. Of last year's imports the great bulk, 425,255 lbs., was received from Turkey and 19,570 lbs. from Persia. Of the imports of opium in 1889, 409,738 lbs. were re-exported, leaving 82,377 lbs. for home consumption, which is about twice the quantity used in 1850.

THE IODINE ABSORPTION OF ESSENTIAL OILS AS A CRITERION OF PURITY.

A Volunteer Paper.

By H. W. Snow, Ph.C.

Read at Meeting of the Michigan State Pharmaceutical Association, September, 1890.

In the "New Idea" for March, 1889, p. 19, the writer presented the results of some work performed on the absorption of iodine by essential oils. The work included the examinations of twenty-one essential oils and three stearoptens. These results were meagre, but interesting, and at that time no similar work had appeared in English. Unknown to the writer, however, Mr. C. Barenthin had published, in the Archiv der Pharm., for October, 1886, the results of determinations for eighteen oils, though no translation had appeared in English. The next month, Mr. R. H. Davies published an interesting paper on the same subject, giving the results of determinations of twenty-nine essential oils and four stearoptens. Mr. Davies was likewise unaware of the work done by previous investigators, though he afterwards traced the work of the German pharmacist, and was able to compare it with his own. Six months later, Mr. Rowland Williams, strange to say, wholly unaware of the work done by pharmacists, notwithstanding the discussion it had created in his own country, gave in the Chem. News, October 11, 1889, p. 175, the results of his own work, saying: "To the best of my knowledge, this test has never before been applied to essential oils." Four papers have therefore appeared on this subject, and it is the object of this one to compare the work of the different investigators, to add some further results obtained by the writer, and to draw such conclusions as seem to be warranted from its present status. The

details of the process it is unnecessary to give, simply referring to it as the well-known Hübl's process for determining the iodine absorption of fixed oils and fats.

TIME OF DIGESTION.

The absorption by this method, as applied to fixed oils, is complete in from three to four hours. The writer seems to have been the only analyst who performed any experiments with a view to fixing the proper time of digestion of the iodine solution and essential oil before titrating to determine the excess. The others either ignored the question or assumed that it was completed in the same time as is the case with fixed oils. Barenthin digested his iodine solution and oil together for "three or four hours." Mr. Williams makes no mention of the time, though his failure to specify any different time would lead us to believe that he, too, took the usual time. Mr. Davies, on the other hand, allowed his oils to stand in contact with the iodine "during one night," which would probably be from 15 to 17 hours' time. The writer may give here a tabulated statement of the results of determinations for different periods of time:

	Time of Digestion.					
	3 hrs.	6 hrs.	15 hrs.	24 hrs.	40 hrs.	48 hrs.
Oil Peppermint, .	21·1	22·8	24·5			
" "					179	179
" "					110	110
" "					120	126!
" Bergamot, . .			300			345
" Orange Peel (Bitter), . .			321			362
" Turpentine, .	291	33·3	345	353		397
" Peppermint (Adult), . .		84·7!	74·1!			
" Peppermint (Adult), . .		88·3!	73·6!			
" Thyme, . . .			210!		183!	
Thymol, ...			201!		181!	

From these results, and some observations by Mr. Davies, we may infer that the rate of absorption is not equal for all oils, and perhaps not even for all samples of the same oil. Also, it is evident

that, in many instances, the absorption is not complete within a period of twenty-four to forty-eight hours; though in four instances the longer digestion shows less absorption than the shorter period. This same phenomenon was also noticed later in the case of turpentine with simple chloroform solution of iodine.

These experiments are not in themselves sufficient to fix the proper length of time in which the oils and iodine should remain in contact, but in the writer's work 40 to 48 hours was at first allowed. This, however, is too long for practical purposes, and a conventional time will probably have to be adopted. The "standing over night," or a period of about 16 hours, recommends itself to the writer, and in recent work has been followed.

COMPARISON.

In the following tables, the results obtained by the different operators are placed side by side for comparative purposes. It must be borne in mind that the difference in time allowed by the different operators may produce different figures. Mr. Williams and Mr. Barenthin having evidently operated during the same length of time; it is possible to compare their results. The writer's later work, however, that in the fourth column, was performed with about sixteen hours' digestion ("over night"), and can, therefore, be compared with that of Mr. Davies. The number of oils examined was limited, but I may say that those given in column four were of my own distillation, and their purity is therefore assured.

Oil.	Barenthin. Time, 3 to 4 hrs.	Williams. Time, 3 to 4 hrs.	Davies. Time, about 16 hrs.	Snow. Time, about 16 hrs.	Snow. First work	
					15 hrs.	40 hrs.
Oil Almonds,			*None.			
" " (prussic acid, free),			*None.			
" Aniseed,		274·4				121·0
" "		185·9				
" " Russian,			189·7			
" " star anise,				186·0		
" Bergamot,	260·0	247·9	276·1		300·0	345·0
" "		283·7				
" Birch, see Winter-green,						
" Cajeput,		70·8				
" "		151·0				
" Chamomile,			*68·1			
" "			*72·1			
" "			65·5			
" Calamus,	155·0		181·4			
" Camphor,						129.0
" Caraway,	265·	258·3	*254·9			233·0
" "		263·2				
" Cardamom,			*139·3			
" Cassia,		75·1	159·5			
" "		71·7				
" Cedar wood,		78·5				
" "		74·8				
" Celery,			*311·6			
" Cinnamon,	100·0	128·1	189·5			
" "		105·1				
" Citron,		359·7				
" "		320·0				
" "		353·9				
" Citronelle,		191·3				
" "		186·3				
" Cloves,	270·0	179·8	*362·5	354·0		467·0
" "		155·5	*355·1		291·0	
" "			*349·5			
" " (half from stems),			*366·6			
" Copaiba,				260·0		250·0
" Coriander,						385·0
" Cubebs,			226·8	268·0		
" "			223·1			
" "			226·0			
" Cummin,			81·6			
" Dill,			*257·1			
" Erigeron,						280·0
" Eucalyptus,	235·0	61·7				
" "		106·5				
" "		110·7				
" Fennel,	140·0		158·3	175·0		
" Juniper,	245·0	273·6	*337·3			
" "		236·1	363·9			
" "		250·1				

Oil.	Barenthin. Time, 3 to 4 hrs.	Williams. Time, 3 to 4 hrs.	Davies. Time, about 16 hrs.	Snow. Time, about 16 hrs.	Snow. First work	
					15 hrs.	40 hrs.
Oil Lavender,	170·0					286·0
" " Eng.,		232·9	265·5			
" " " Mitcham,		230·4	273·9			
" " " "		248·6	274·9			
" " (French),		198·6	294·5			
" " "		237·2	262·7			
" " "		199·2				
" " Spike,		287·9				
" " "		207·1				
" Lemon,	285·0	323	328·3			343·0
" "		320·2	340·3			
" "			345·3			
" "			348·9			
" "			348·0			
" "			345·6			
" "			355·1			
" Lemon grass,		223·2				
" " "		271·5				
" Limes,						289·0
" Mace,		220·8				
" "		224·0				
" Nutmeg,		201·9	*308·3			
" "		206·2	321·5			
" Orange,		347·7				
" "		341·7				
" " Bitter,					321·0	362·0
" Origanum,	227·0					
" Parsley,			255			
" Peach Kernel,			None.			
" Pennyroyal,		85·9	188·9			152·0
" "		78·6				
" Peppermint, Amer.,		71·7	132·2			179·0
" " "		53·1	143·9			109·0
" " "			121·8			146·0
" " "						113·0
" " "						71·0
" " Eng.,		36·8	51·2			
" " "		46·4	49·6			
" " "			57·7			
" " Jap.,		56·1	48·1			64·0
" " "		37·1	43·5			
" Petroleum,				Small am'ts.		
" Rosemary,	185·0	161·7	325·			
" "		142·4				
" Rue,		192·0				
" "		121·3				
" Sage,		49·7				
" "		117·0				
" Sandal wood,			226·6			
" "			233·9			

Oil.	Barenthin. Time, 3 to 4 hrs.	Williams. Time, 3 to 4 hrs.	Davies. Time, about 16 hrs.	Snow. Time, about 16 hrs.	Snow. First work	
					15 hrs.	40 hrs.
Oil Savine,			279·5			
" Sassafras,		162·7				166·0
" "		151·0				
" Spearmint,			207·3			
" Thyme,	170·0				210·0!	183·0!
" " (red),		181·5				
" " "		168·4				
" Turpentine,	300·0		377·0		345·0	397·0
" Valerian,	80·0					
" Verbena,		267·8				
" "		247·8				
" Winter-green, true,						1·0
" " (oil birch),						3·3
" " synthetic,						3·8
Anethol,			177·4			
"			182·9			
"			177·8			
Camphor,			0·46		2·8	
Menthol,			0·12			None.
Thymol,			171·5		201·0!	181·0!

The writer will not attempt to pass any extended remarks on these figures. A critical examination of them speaks for itself. However, attention may be directed towards Aniseed, Cassia, Cinnamon, Cloves, Eucalyptus, Juniper, Nutmeg, Pennyroyal, Peppermint, Rosemary and Sage.

As regards purity, it may be said that Mr. Williams obtained the oils under assurance of their purity, the purpose to which they were to be put having been specified. Mr. Davies felt the "utmost confidence in the genuineness" of those oils marked in this table with an asterisk. Some of the oils used by the writer were distilled in small quantities by himself, for the purpose of this examination, viz: those in column four. The others were purchased in open market from good sources, though no mention was made of the purpose to which they were to be put.

CHLOROFORM IODINE.

The long time required to complete the reaction in the use of Hübl's solution, the instability of this solution and certain peculiarities which it exhibited led the writer to try a simple chloroform

solution of iodine, the process being otherwise conducted the same. The results as obtained in different periods of digestion are very different to those obtained by the use of Hübl's solution and the action may be said to be more rapid though it is not uniform for all oils. The results are given in the table for a limited number of oils as follows:

	Time of Digestion.								
	4½	7½	8	18½	22	24	49	55	Hübl's.
Oil turpentine, .	98	91			80				397
" peppermint,	46	48			50				113
" copaiba, . .	81			81					250
" coriander, .	81			78					385
" cloves, . .	29			56		72	122	121	291
" camphor, .	45		53						129
" limes, . . .	67		62						289
" sassafras, . .	35		43						166

FRACTIONAL DISTILLATION.

The writer scarcely looks for a close degree of uniformity in the "iodine numbers" of essential oils. It is scarcely to be expected that bodies of such complex composition as these essential oils will furnish "constants" in the ordinary use of the term. The variations in specific gravity and boiling points, as well as the variable specific rotatory power of those that are optically active, are well known. The iodine number, as already reported upon, is in some cases quite constant. In casting around for some means of partially compensating for this, the writer naturally first thought of fractional distillation. Some of the advantages which accrue from it were pointed out in a paper on Oil of Peppermint, in which it was shown that a fraction of one dram from one ounce of oil of peppermint did not have a much higher absorption number than the oil undisturbed by fractional distillation. The figures, as then obtained, were 105 for the natural oil, and this yielded a one-eighth fraction having 123 for the number, while the pure oil, to which was added 13 per cent. of turpentine, yielded 280 for its iodine number. At that time experience justified the statement that an oil yielding, from the fraction of one dram from one ounce, less than 125, for its iodine absorption is not

very likely to be adulterated with turpentine. Only once thus far has the writer found an oil having a higher absorption in the original than this, and, as already stated, that oil is still open to question. If the oil exceeds 125 it is a suspect, and running over 185 may be discarded. With much turpentine present the fraction will have an absorptive power over 225.

Since then, an oil examined by more thorough fractional distillation, taking one-eighth of one-fourth, the distillation being conducted in a 4 oz. fractional distillation flask, showed 146 and 223. Notwithstanding the fact that, by the statement above, this oil should have been excluded, it was passed. If it contained any turpentine, the amount was too small to be of any consequence. The high number of *oil of cloves* would indicate that iodine absorption would not be of much value in detecting turpentine if added. The ordinary turpentine of commerce cannot be used as an adulterant to any advantage. Some trials by the writer showed conclusively that 1 in 8 could be readily detected by the nose, 1 in 16 was not so apparent and would pass, but when one-eighth was distilled in a small retort, the fraction was all terebinthinate in odor, with only a faint suggestion of cloves. The oil pure, oil pure one-eighth fraction and the oil to which one-sixteenth of its volume of turpentine was added, showed iodine numbers (the time being 17 hrs.), as follows: 354, 364, 370; the indications so far as iodine numbers were concerned. The same oil and fractions were then tried with simple chloroformic iodine; bearing in mind that oil of cloves absorbed slowly, while turpentine was highest in a short period, only two hours' digestion was allowed. Results were as follows: 54 for pure oil, 60 for the fraction and 100 for the fraction containing turpentine; with oil of camphor, somewhat similar results were obtained. Oil of camphor, one volume, was added to seven volumes of the same oil of cloves, as in the preceding. Its presence was not noticeable by the sense of smell, but in the fractions could be distinctly noticed; with Hübl's solution, the iodine numbers were 354, 364, 332. This completes the writer's work to the present. Fractional distillation promises well in connection with this line of investigation. It is hoped that others will follow up the subject, as it is my intention to collect data as rapidly as other duties will permit.

ON THE MEDICINAL VALUE OF POMEGRANATE BARK.

By J. B. Nagelvoort.

In *N. Tijdsch. v. Phar., Chem., Toxicol.*, Oct., 1890, Professor W. Stoeder, of the University of Amsterdam, Holland, gives the following information concerning the use of pomegranate bark by the natives of East India (Java):

The natives prefer the bark of the root of trees with *white* flowers, to expel tænia. There is also a variety with *black* flowers. Trees with *red* flowers are, however, in Java, the most common, as is the case in Europe. On submitting the root-barks of the 3 varieties to the assay process of the Dutch Pharmacopœia,[1]

The white-flowered variety yielded 3·75 per cent. of hydrochlorates.
" black " " 1·71 " "
" red " " 2·43 " "

I take pleasure in bringing these observations of Professor Stoeder to the notice of the pharmaceutical chemists of this country, and at the same time desire to direct attention to a statement of mine, made some years ago (see *Hager, Phar. Praxis*, Erg. Bd., p. 503), that experiments made in Batavia had shown no difference in the effects of the bark of the root and branches. At that time, reliable assays of pomegranate bark were not generally known, and I used indiscriminately the bark of the whole tree, or, to be more correct, of the large shrub.

It is the place here to call the attention of the readers to the fact that the *root-bark* of the cinchonas contains some cinchona alkaloid; and that emetine is found, if I remember correctly, in the woody part of the ipecacuanha root, always considered worthless.

Professor Stoeder does not state if his figures are averages. From a perusal of the original, I am inclined to think that they are the

[1] The following is the process: 10 gm. of the bark, reduced to a fine powder, are mixed with 2 gm. slaked lime, 100 cc. water, and 2 gm. solution of caustic soda, 1·33 sp. gr.; macerate for 24 hours, under frequent agitation; transfer to a percolator and displace with small quantities of water to exhaustion. Agitate the percolate in a separator with chloroform, taking small quantities in succession, to exhaustion. Exhaust the chloroformic solution in another separator, first, by strongly agitating it with 10 cc. water, acidulating carefully with nHCl, and afterwards with 5 cc. water alone. (Repeat this as long as Mayer's reagent gives a reaction for alkaloid.—J. B. N.) Evaporate, on a water-bath, the combined watery fluids, dry above H_2SO_4 to constant weight. 10 grams of drug shall yield not less than 0·1 gram hydrochlorate of total alkaloid.

results of the analysis of one sample. The large variations I find daily in alkaloid or other active principle of important drugs[2] make this suggestion necessary. This does not belittle in any way the value of estimating alkaloidal strength, over the old way of trying Extractum Punicæ Granati on its physiological effect only, as I did. Assays of the tree-bark are desirable, however.

CHEMICAL NOTES.

By Henry C. C. Maisch, Ph.G., Ph.D.

The Fruit of Erythroxylon Coca. C. J. H. Warden (*Pharm. Journ. and Trans.*, 1890, xxi, 1) analyzed coca fruit, grown near Calcutta, according to Dragendorff. He found: I. moisture, 5·423 per cent. determined at 100° C. after partial desiccation over sulphuric acid; II. petroleum ether extract, 4·540 per cent., containing 3·021 per cent. glycerides of fatty acids and 1·519 per cent. impure phytosteric and coloring matter; III. ether extract, 0·44 per cent., the solubilities being as follows: petroleum ether dissolved, 0·232 per cent.; water, 0·110 per cent., containing cocaine; absolute alcohol, 0·069 per cent.; the remaining 0·029 per cent. being only soluble in ether; IV. extract with absolute alcohol, 3·820 per cent., containing cocatannic acid and trace of alkaloid; V. aqueous extract, 23·44 per cent.; VI. ash, 4·271 per cent.

On a Cocaine double salt. W. Miller (*Pharm. Zeitg.*, 1890, xxxv, 522) obtained, by mixing concentrated solutions of mercuric chloride and cocaine hydrochloride, a double salt having the composition $C_{17}H_{21}NO_4,HCl,HgCl_2 + 2H_2O$ as a voluminous precipitate. Washed and dried in a desiccator, the salt appears to be finely crystalline. At 124° C. the salt melts to a clear, colorless liquid which on cooling forms a turbid mass. Besides possessing the anæsthetic property of cocaine, it also has, when brought on the tongue, a distinct metallic taste.

A new Alkaloid from Chrysanthemum cinerariæfolium. F. M. Zuco (*Rendiconti d. Acad. dei Lincei (Roma)*, 1890, (vi, 571–575) obtained from the flowers of the above plant by treatment with ether two crystalline bodies, one of which is a paraffin and the other a

[2] Belladonna root with 1 per cent., instead of 0·4 to 0·5 per cent. alkaloid, as usual. Cantharides with 1·2 per cent. cantharidin against 0·3–0·5 per cent. as given in text-books on pharmaceutical chemistry.

higher homologue of cholesterin. On treating the flowers now with alcohol, the author obtained a crystalline glucoside in small quantity. The alcoholic extract furthermore contains an alkaloid, *chrysanthemine* which is very soluble in water. This solution can be evaporated on the water-bath without affecting the alkaloid; if pure, this forms a colorless syrupy liquor. Most of the salts are not crystalline, and are soluble in water, alcohol and ether. The characteristic salt is the gold chloride double salt; it crystallizes in small golden-yellow needles, very soluble in hot, and slightly so in cold water, easily soluble in alcohol and also in a mixture of equal volumes of alcohol and ether. Potassiobismuthic iodide turns the salts to an orange-color, while potassio-mercuric iodide gives a yellowish-white color. Platinum chloride, picric acid, tannin and phosphotungstic acid produce no precipitate. The formula of the gold salt is $C_{14}H_{30}O_3N_2Au_2Cl_8$, the hydrochloride then having the formula $C_{14}H_{30}O_3N_2Cl_2$.

At the meeting of physicians and scientists at Bremen, August 15—20, 1890, Dr. H. Thoms (*Chem. Zeitg.*, 1890, p. 1284) reported an analysis of the foregoing flowers. He succeeded in isolating an ethereal oil; a volatile acid; a wax; a non-volatile, balsam-like acid; chlorophyll; a resin acid; tannin; an alkaloid (see above); a glucoside, and sugar. Physiological experiments, in which *Blatta orientalis* was the subject, showed that the petroleum ether extract, consisting of the ethereal oil and volatile acid, had the toxic effect. The non-volatile acid, although being disagreeable to the insects, had no toxic effect, while the glucoside seemed to be relished by the roaches. Besides these the experiments of Schlagdenhauffen and Reeb (see this volume, p. 456) also show that the toxic property resides in the volatile acid. Dr. Thoms gives the following method as furnishing a criterion for the value of this insect powder. The powder, which has been dried at 100° C., is exhausted in an extraction apparatus with petroleum ether, the solvent evaporated and the extract heated to 80° C. until constant in weight. The residue thus obtained is brownish-yellow in color, has the consistency of a salve and a strong odor of the flowers. From one specimen the author obtained 5·34 per cent. of residue; from others the amount of residue was between 5·003 and 3·89 per cent. Besides this assay, the microscopical examination and the estimation of the ash are necessary to obtain the information whether or not the insect powder is adulterated.

GLEANINGS FROM THE GERMAN JOURNALS.

By Frank X. Moerk, Ph.G.

Preparation of methyl phenacetine.—According to the German patent granted to the Farben-fabriken (formerly Friedr. Bayer & Co.), *p*-acetphenetidine (phenacetine) is dissolved in xylol and to the boiling solution metallic sodium is added; phenacetine-sodium soon separates in white needles which is then treated with methyl iodide forming methyl phenacetine and sodium iodide. The former is soluble in xylol and is separated from the latter by filtration; the filtrate is freed from xylol by distilling in a current of steam, and the remaining oil after drying is distilled in a vacuum; between 295° and 305° C. methyl phenacetine distils as a colorless oil which, after standing, solidifies. An oily body (a side product in the manufacture) is removed by expression and the methyl phenacetine purified by crystallization from ether or alcohol. The purified substance melts at 40° C., is moderately soluble in water, easily soluble in ethereal solvents.—*Chemiker Ztg.*, 1890, 1355.

Carvacrol iodide.—Substituting carvacrol for thymol (see Amer. Journ. of Pharm., 1890, 129) in the preparation of aristol an iodine derivative of similar properties is obtained, the only difference between the two being in their behavior towards light; aristol is decomposed, the new body is not. In the patent granted to the Farben-fabriken, the following proportions of the chemicals used are given: A dilute solution of 1·5 kilos carvacrol in 1·6 kilos sodium hydrate is mixed with 10·16 kilos each of iodine and potassium iodide and the mixture made alkaline; the yellow precipitate obtained, purified by washing with water, forms after drying a yellowish-brown powder, and melting at 90° C. Patents have also been granted for iodine derivatives of phenol, resorcin and salicylic acid, which are all made in a similar manner. These substances are to be used for pharmaceutical purposes.—*Chemiker Ztg.*, 1890, 1355.

Lanolin, a vehicle for acid and saline solutions.—Prior to the use of lanolin, the introduction of such solutions into the dermatological practice was impossible; Unna recently published the following formulas:

Unguentum Aceti.—Aceti, 4·00; Unguenti simplicis, 20·0; Lanolini, 1·00 (camphoræ, 0·5–1·0). The addition of camphor in this ointment is to be recommended.

Unguentum Aluminii acetici.—Liquoris Aluminii acetici, 40·0; Unguenti simplicis, 20·0; Lanolini, 10·0.

Unguentum Calcii bisulfurosi.—Solutionis Calcii bisulfurosi, 40·0; Unguentum simplicis, 20·0; Lanolini, 10·0. The commercial solutions of bisulphite of calcium range in specific gravity from 1·06 to 1·10 at 15° C.; an average solution sp. gr. 1·08, contains 5·61 per cent. $CaSO_3$ and 4·88 per cent. free SO_2. If the calcium bisulphite solution be mixed with anhydrous lanolin, an ointment is obtained which does not evolve SO_2; by mixing this ointment with water SO_2 is liberated. If, however, the lanolin be mixed with a glycerin-fat, as in the above formula, the mixture acts as a rich reservoir of SO_2. Calcium bisulphite solution is used instead of aqueous sulphurous acid, because the sulphuric acid formed by oxidation of the sulphurous acid will unite with the calcium, and only the action of SO_2 is obtained.

Unguentum Hydrogenii peroxydati.—Solutionis Hydrogenii peroxydati, 20·0–40·0; Vaselini, 20·0; Lanolini, 10·0. To retard the action of the H_2O_2 an addition of vinegar may be made. This ointment is an excellent article to remove comedones.

Unguentum Calcii chlorati.—Solutionis Calcii chlorati (33·3 per cent.), 40; Unguenti simplicis, 20·0; Lanolini, 10·0. This neutral calcium chloride ointment is useful as a base in the treatment of Acne Ichthyosis, etc ; additions of zinc ointment, precipitated sulphur, hydrogen peroxide, resorcin, etc., may be made in such treatment.—(*Therapeut. Monatshefte*) *Pharm. Centralhalle*, 1890, 549.

Rancidity of fats has been very carefully investigated by D. E. Ritsert, with the following results: Rancidity is not due to the presence of bacteria, as sterilized fats will become rancid; it is due to a direct oxidation of the fat by the oxygen of the air, and is intensified by exposure to light. Fats carefully protected from the atmospheric oxygen if exposed to direct sunlight will not become rancid. The presence of moisture is not regarded as essential to the change. To preserve fats, the first condition to be complied with is to absolutely prevent access of air; this attained, it is immaterial if the fat be exposed to light or not.—*Pharm. Ztg.*, 1890, 579, 586 and 602.

The red color of sulphuric acid, noticeable quite frequently in the commercial acid, is due to the presence of small quantities of ferrous iron, and at the same time of some of the oxides of nitrogen. The

iron impurity is introduced by keeping the acid in iron containers (an acid of 66° B. will not dissolve iron, but one of the strength of 60° B., will dissolve small quantities). The best means of preventing the red color is to denitrate the acid by addition of a little ammonium sulphate; the color may also be discharged by heat.—R. Nörrenberg (*Chem. Industrie*), *Pharm. Ztg.*, 1890, 595.

Recovery of silver and gold from potassium cyanide solutions.—To recover *silver* it is only necessary to suspend a piece each of sheet zinc and sheet iron in the solution for two days, collect the fine deposit of silver which, however, generally contains some copper, wash, dry, dissolve in concentrated sulphuric acid, dilute with water and precipitate the dissolved silver by suspending a strip of copper in the solution.

To recover *gold* add to every 100 litres of solution one-half kilogram zinc dust, agitate frequently during two or three days, collect the precipitate containing gold and quite often silver and copper, wash, and, by treatment with hydrochloric acid, remove the excess of zinc and then by use of nitric acid the silver and copper; the residue remaining will be pure gold.—Stockmeier and Fleischmann (*Industrie Blätter*) *Chem. tech. Central. Anzeiger*, 1890, 373.

A new albumin test.—To 8–10 cc. of the suspected urine add an equal volume of strong hydrochloric acid and then, without agitation, with a pipette 2–3 drops of a concentrated solution of chlorinated lime; the presence of $\frac{1}{100}$ per cent. albumin will cause a white turbidity in the upper part of the test. By diluting albumenoid urine with known quantities of water until the test in the diluted urine is no longer obtained a rapid and approximate estimation of albumin may be made.—Dr. A. Jolles (*Fresenius Ztschr. f. an. Chem.*) *Pharm. Post*, 1890, 781.

The preparation of pure gases, carbon dioxide, sulphur dioxide, etc., is conveniently carried out by mixing acid sulphate of sodium with the acid or neutral salt which contains the gas desired. To make CO_2, for instance, the acid carbonate and acid sulphate of sodium are taken in molecular proportion, placed in a generating flask and a little water added; a steady and prolonged evolution of pure but moist gas results.—H. Bornträger (*Ztschr. f. an. Chem.*) *Rpt. der Pharm.*, 1890, 213.

Linoleic acid.—The formula of this acid has been ascertained to

be $C_{18}H_{32}O_2$, and not $C_{16}H_{28}O_2$. By treatment with fuming hydriodic acid a compound of the formula $C_{18}H_{35}O_2I$ was obtained, which by reduction with zinc and hydrochloric acid and subsequent purification was found to yield stearic acid $C_{18}H_{36}O_2$.—A. Reformatzky (*Journ. f. prakt. Chem.*) *Rpt. der Pharm.*, 1890, 214.

Solubility of ether in sulphuric acid.—A German patent has been granted the firm J. D. Riedel for the purification of ethyl bromide in which the ether present in the crude ethyl bromide is removed by treatment with sulphuric acid. The behavior of ether towards sulphuric acid is variously stated in works on chemistry, so the following results of investigations are interesting: Ether dissolves easily in sulphuric acid with production of considerable heat. No chemical combination takes place even after prolonged standing, the ether being separable again by addition of water. Prolonged heating (for 30 hours) at 100° C. results in the formation of large quantities of ethyl sulphuric acid, $C_2H_5HSO_4$, with smaller quantities of diethyl sulphate $(C_2H_5)_2SO_4$; stronger heating brings about decomposition into SO_2, C_2H_4 and H_2O.—Dr. L. Scholvien, *Apoth. Ztg.*, 1890, 607.

Phenylurethane or Euphorine, as it has been called lately, has the formula $CO<\begin{matrix}OC_2H_5\\NH(C_6H_5)\end{matrix}$, is a white crystalline powder of a faintly aromatic odor and gradually developing taste, resembling cloves; it is difficultly soluble in water, easily soluble in alcohol and sufficiently soluble in wines to be administered in such solutions.—*Pharm. Centralhalle*, 1890, 616.

Morphine estimation.—The Helfenberger morphiometric assay of opium (adopted in the new German Pharmacopœia) has been so modified that an assay can be made in less than three hours without decrease of accuracy; the differences in morphine-yield are generally less than 0·3 per cent. Six grams of finely-powdered opium are triturated with six grams water, diluted with more water, the mixture rinsed into a tared flask and water added to make 54 grams. After frequent agitation during fifteen minutes it is filtered through a plaited filter of 10 cm. diameter; 42 grams filtrate are mixed with 2 grams of a mixture (made by adding 83 grams water to 17 grams ammonia solution) by a rotatory motion (not by agitation), and filtered at once through a plaited filter of 10 cm. diameter. To 36 grams of this filtrate in a tared flask are added 10 grams acetic ether, mixed by a rotatory motion, 4 grams of the above

diluted ammonia solution added, the flask corked and agitated thoroughly for 10 minutes. To separate the emulsion formed 10 grams additional acetic ether are added, the ethereal layer carefully poured off, and after addition of 10 grams acetic ether, the ethereal solution again decanted and the contents of the flask poured into a plain filter of 8 cm. diameter; the flask and filter are twice washed with 5 grams water saturated with acetic ether, and after allowing to drain, both flask and filter are dried at 100° C., the filter contents transferred to the flask and the latter dried to constant weight.—E. Dieterich, *Pharm. Centralhalle*, 1890, 597.

Loof's morphine estimation in opium (Am. Journ. Pharm., 1890) has been critically examined by E. Dieterich; the conclusions based upon numerous assays are here given: 1. The use of oxalic acid is unnecessary, as the calcium salts present in opium are not precipitated by potassium carbonate until after 10–12 hours' standing. 2. The filtration of the precipitated narcotine often proceeds so slowly that thrice the time given by Loof is necessary to filter off the required quantity; after one-half minute's standing, the morphine will commence precipitating. 3. The precipitation of narcotine is not immediately complete, as stated; narcotine contaminating the morphine obtained. 4. Potassium carbonate has no advantages over ammonia in precipitating morphine, as this alkaloid is soluble in excess of both precipitants to the same extent. 5. By weighing the morphine from only one gram of opium any slight error in the estimation becomes of considerable importance when the results are given in percentage.—*Pharm. Centralhalle*, 1890, 591.

Azoimide, a new hydrogen nitride.—One of the most interesting announcements in chemical research is the discovery of an *acid* containing only the two elements, *hydrogen* and *nitrogen*. The acid in many respects is analogous to the halogen acids; it forms a gas of penetrating odor, is easily soluble in water and has a strong acid reaction; but differs in having the formula HN_3 explained by the structural formula $H—N\begin{matrix}/\ N \\ \|\ \ \\ \backslash\ N\end{matrix}$ With ammonia it forms white fumes of NH_4N_3 or N_4H_4; metals are rapidly dissolved by it with evolution of hydrogen. The barium, mercurous and silver salts, BaN_6, Hg_2N_6 and AgN_6 respectively, have been prepared; the last two are very explosive. The acid is obtained by a series of organic reactions

which result in the formation, among other products of the sodium salt, NaN_3, which by treatment with sulphuric acid gives the new compound.—Dr. Curtius, *Pharm. Ztg.*, 1890, 623.

ABSTRACTS FROM THE FRENCH JOURNALS.

TRANSLATED FOR THE AMERICAN JOURNAL OF PHARMACY.

PREPARATION OF BENZOATE OF MERCURY.—Two solutions are made, the first containing: Mercuric oxide, 125 gm.; nitric acid sp. gr. 1,20), 250 gm.; distilled water, 4,000 gm.; and the other containing: Benzoate of sodium, 188 gm.; distilled water, 4,000 gm. The solutions are slowly mixed while stirring. A white, voluminous precipitate is formed, which is taken up on cloth and washed with distilled water until no acid reaction can be obtained. The precipitate is then dried in a stove; it is a white, light powder, wholly insoluble in water, but soluble with heat in solutions of chloride of sodium. The preparation for hypodermic use is made as follows: Benzoate of mercury, 30 cgm.; chloride of sodium, 10 cgm.; hydrochlorate of cocaine, 15 cgm.; distilled water, 40 gm. This gives a limpid solution, but the presence of cocaine causes the precipitation of a small quantity of the mercury. The amount usually given is the contents of a Pravaz syringe, once daily, until 15 to 30 injections have been administered. The formula is that used by Drs. Balzer and Thiroloix in the treatment of syphilis.—*Jour. de Méd.*, Sept.

TEST OF SALICYLIC AND SALICYLURIC ACIDS IN URINE.—M. Grenouillet (*Jour. de Ph. et de Ch.*, Sept. 1), evaporates 500 ccm. of urine to 150 ccm. After filtering and cooling, he agitates the liquid with 150 ccm. of ether. On evaporation of the ether, the residuum is taken up by boiling water and this gives, with perchloride of iron, the violet coloration characteristic of salicylic compounds. As the coloration may be due to either salicylic or salicyluric acid, it is necessary, in cases in which it is desirable to know which of these substances is present, to heat the residuum obtained after the evaporation of the ether, when the salicylic acid volatilizes. Benzin may be employed in place of ether. The author used this method in recent examinations of urine containing naphthalol (or naphthosalol), a salicylate of phenol. As his experiment was successful, he

concluded that this compound changes in the system, where it is decomposed into salicylic and salicyluric acids.

Lead Poisoning from Flour.—M. Lemaistre reports the cases of 120 persons poisoned by the use of flour prepared in a mill (at Limoges) whose burr stones had been repaired by filling their cracks with lead. None of the patients died.—*Jour. de Méd.*, Oct. Wholesale poisoning from the same cause was reported in Amer. Jour. Phar, 1866, p. 366.

Vigier's Embrocation for Chapped Hands.—The formula is given in the *Jour. de Méd.*, Oct., as follows: Tannic acid, 50 cgm.; neutral glycerin of 30° B., 20 gm.; rose water, 200 gm. Other French preparations for the same purpose are formulated in the same journal, as follows: A. Lanolin, 50 gm.; vanillin, 10 cgm.; essence of rose, 1 drop. B. Lanolin, 100 gm.; paraffin, 25 gm. vanillin, 10 cgm.; essence of rose, 1 drop.

Besnier's Preparations for Chilblains.—The *Jour. de Méd.*, for October, gives the following: Bathe the extremities in a decoction of oak leaves and wipe dry. Apply camphorated alcohol with friction. Powder the surfaces with a mixture of salicylate of bismuth, 10 gm. and starch, 90 gm. To quiet the nocturnal itching apply the following: Glycerin and rose-water, of each 50 gm.; tannic acid, 10 cgm. Then powder the parts, as before, with the bismuth and starch mixture. In case ulcerations are present they should be dressed with oak leaves softened by soaking in water.

Quick Test for Mineral Acids in Vinegar.—M. Balzer writes to the *Répert. de Phar.*, for October, that he has abandoned the old method of testing with starch and iodine, on account of the time required for it. He uses instead a very weak aqueous solution of methylaniline violet. A few drops of the vinegar to be tested is poured upon a plate where it is agitated with a glass stirrer previously dipped in the methylaniline solution. If mineral acids are present the violet coloration disappears and is replaced by a well-marked tint of blue or green. Sulphuric and hydrochloric acids give the green shades; nitric acid produces a blue coloration.

Glycerin Suppositories.—M. Balland (*Union Phar.*, September 15th), makes a satisfactory suppository in accordance with the following formula: Lanolin, 2 gm.; glycerin, 2 gm.; cacao butter, 1 gm.; white wax, 1 gm. The lanolin is first melted with the wax and the cacao butter. Then the glycerin is added and the mass is

poured into molds. The molds should be placed in a mixture of ice and salt to prevent a separation of the glycerin. The suppositories are divided so as to weigh 6 gm. each, which is heavier than ordinary suppositories, though the bulk is not much greater.

HASCHISCHINE.—Since the publication by Sée and Égasse of their articles on cannabis indica and the statement by the former that it was a true stomach sedative and valuable in certain stomach affections accompanied by painful symptoms, its use appears to have increased in France. The preparation recommended by Sée is known as "the fatty extract." To make this, the drug is digested in butter (see *Répert. de Phar.*, October), or it may be made by dissolving 5 per cent. of haschischine in 95 per cent. of butter. Of this, Sée recommends 5 cgm. daily, in three doses. Larger quantities produce inebriety. Gastinel's haschischine is simply the resin. The *Répert. de Phar.* thinks that this substance should be presented in a more stable and convenient form than that recommended by Prof. Sée, and proposes making it up in granules to contain one milligramme of the drug. Three of these (corresponding to 6 centigrammes of M. Sée's fatty extract) could be administered daily. The same writer thinks that cannabinon, cannabine, cannabeine and tannate of cannabine should be banished from therapeutics as uncertain and unstable preparations.

MONIN'S "KOLA ESSENCE STIMULANT," is formulated in the *Bulletin Méd.* as follows: Essence of kola, 40 gm.; tincture of canella, 5 gm.; essence of menthe, 10 drops; flavored, mucilaginous water, 100 gm. To be taken during the 24 hours. The kola essence is made from roasted kola. A given quantity of the essence represents one-half, by weight, of the nut.

HOECKEL'S TINCTURE OF KOLA is made as follows: Tincture of kola (5 per cent.), 10 gm.; tincture of vanilla, 10 drops; simple syrup, 60 gm.; distilled water, 40 gm. An *elixir* is prepared by adding 125 gm. of kola tincture, to 275 gm. of Garus elixir. Of the latter, two to four tablespoonfuls may be taken daily.

KOLA PILLS.—Extract of kola, 10 gm.; powdered kola, q. s.; divide into 100 pills; 10 to 15 of these may be taken daily.

KOLA MIXTURE.—Extract of kola, 1 gm.; syrup of cydonium, 60 gm. This quantity is to be given in teaspoonful doses daily for diarrhœa of children.

ON THE INFLUENCE OF ALKALIES ON TISSUE-CHANGE IN MAN.[1]

By Dr. Stadelmann.

This research was undertaken to investigate whether large doses of the alkalies, as the author gives them, especially in diabetes, does not in some way unfavorably influence tissue-change. The experiments were made upon his pupils, who were in a state of nitrogenous equilibrium, and alkalies were given in large doses extending over long periods. The substances exhibited were carbonate, bi-carbonate, and citrate of sodium. The salts of vegetable acids were much more readily absorbed than the carbonates, and were excreted partly as carbonates; while the carbonates were at once acted upon by the gastric juice taking up the hydrochloric acid, thus acting injuriously, both on tissue-change and digestion. The nitrogenous constituents of urine, ammonia and uric acid, were diminished after alkalies. As regards the amount of urea excreted, the cases varied, oscillating between excess over normal, and the reverse, but taking the average over a long period the quantity passed was very nearly normal. The amount of nitrogen in the fæces increased with the diminished consistence of the stools, and occasionally reached double the normal. There was always more or less diuretic effect after the alkalies, and increased oxidation of body-fat seemed also to take place. Phosphoric and sulphuric acids in the urine were diminished, a point of some importance, showing that although by giving acids we may withdraw alkalies from the body, yet by giving alkalies we cannot increase the excretion of mineral acids. It was also found, after giving large quantities of citrate of sodium, that more soda (after deduction of the normal amount) was found in the urine than had been administered. The difference between the absorption of citrates and of carbonates seems to show that citrates are converted into carbonates in the blood, and not in the intestine, as Buchheim supposes. Even in doses of 43 grammes (about 1½ oz.), and after a total quantity of about 600 grammes, citrates caused no dyspepsia, nor any difference in the general health. Further researches were undertaken to determine the effect of alkalies on biliary secretion. A large num-

[1] *Therap. Monatshefte*, August, 1890; reprinted from *Med. Chronicle*, October.

ber of salts were used, and in small doses were found to have no influence; in large doses the secretion was diminished. Thus the beneficial effect of such waters as Carlsbad, in liver disease, must not be ascribed to a cholagogue action, but simply to lessened secretion.

MINUTE OF COLLEGE MEETING.

PHILADELPHIA, September 29, 1890.

A stated meeting of members of the College was held this day, Charles Bullock presiding. The minute of the last stated meeting being read, was, on motion, adopted. The minute of the Board of Trustees for June was read and approved. The report of the Delegates from this College to the Meeting of the American Pharmaceutical Association, recently held at Old Point Comfort, Va., was made verbally by Prof. Remington, as follows:

"The meeting was well attended. The number present was probably augmented by the fact that the preceding meeting had been held on the Pacific, and many were debarred from maintaining an annual attendance. The presence of a number of the earlier and older members was a noticeable feature. Our local and individual pride was greatly honored in the selection of Mr. Alfred B. Taylor, of this city, as the presiding officer. Much interest was manifested in the proceedings and in the work of the various sections of the organization. An event of much interest to pharmacists, and a result of a formation of a committee of the pharmaceutical body upon the mutual relations of druggists and physicians, is the fact of the American Medical Association constituting a section on pharmacy, and extending an invitation to the American Pharmaceutical Association to send as representatives to their body at their annual meeting in 1891, at Washington, twenty-five pharmacists to consider and confer upon these relations."

The President announced the death of William C. Henszey, of the firm of Carpenter, Henszey & Co., of this city, and a member of this College. The subject was, on motion, referred to the Committee on Deceased Members, with a view to the preparation of a memoir.

Mr. Bullock read a memoir on the death and personal history of Samuel S. Bunting, formerly Treasurer of this College (see October number of AMER. JOUR. PHARM.).

The terms of A. P. Brown, Daniel S. Jones and H. Trimble, Trustees, expiring with this date, and the demise of S. S. Bunting having created a vacancy in the Board of Trustees, it was, on motion, resolved to proceed to an election to fill these several places. The Tellers appointed by the chair, Messrs. Boring and Krewson, announced the result to be as follows:

Trustees for three years, Albert P. Brown, Daniel S. Jones, Henry Trimble.

Trustees for unexpired term of Samuel S. Bunting, deceased, William N. Stem.

On motion the meeting adjourned.

WILLIAM B. THOMPSON, *Secretary.*

MINUTES OF THE PHARMACEUTICAL MEETING.

PHILADELPHIA, October 21, 1890.

The meeting was called to order and on motion Mr. William B. Webb was invited to take the Chair. The minutes of the last meeting were read and approved.

Prof. Maisch presented the third part of the Pharmacographia Indica from the authors, Messrs. Dymock, Warden & Hooper, and commented upon its great value for information regarding the medicinal plants of India.

Mr. Joseph W. England stated that he was convinced from observation that nearly all errors made in the putting up of prescriptions were the result of conversation with those around, or some mental pre-occupation; to try and stop part of this trouble he had a card printed, recommending persons while waiting for prescription to commence an unnecessary conversation with the person so engaged; the absurdity of such a request would be the most likely means of stopping it.

Written communications being in order, Mr. Joseph W. England read a paper upon *antiseptic materials*, see page 553. In the discussion which ensued after the reading of the paper, it was asked why the use of alcohol was directed in making the solutions. To this, reply was made that the cloth was so much more readily dried when thus treated than when water only was used.

Dr. C. B. Lowe said that we all were much pleased with the clear distinction made between antisepsis and disinfection, but that in his judgment the preparation of antiseptic materials could not be done in the average apothecary store, that the dispensing-room did not admit of it and that few apothecaries had any other room where such work could be done. In this connection he advised apothecaries not to treat wounds or recent accidents, but refer them at once to a physician, and cited an instance where help was extended by an apothecary to an injnred person and the physician who subsequently saw the case advised the patient to sue for a couple of hundred dollars damages for improper treatment!!!

One of the members present stated that the teachings of the best surgeons now was that absolute cleanliness was the greatest point in antisepsis.

Professor Maisch said that some fifteen or more years ago Professor Dragendorff had a very large number of investigations made under his supervision on numerous organic and inorganic compounds relative to their antiseptic and disinfectant value and that solutions of mercuric chloride and iodide were shown to be the most powerful agents for destroying bacteria and for preventing their development. Since then a great number of experiments made by distinguished operators in this department of hygiene amply proved the correctness of his statements; and solutions of these salts were now used so dilute as scarcely to be called poisonous, except when taken in large quantities.

Mr. Beringer asked Mr. England whether he had experimented with Lister's last proposed substance, mercuric cyanide, and with what results; the reply was that he had not, but he learned that it had not proven as satisfactory as Mr. Lister had expected.

A discussion upon the difference that has been observed in the action of ether for anæsthetic purposes of the different manufacturers led to the state-

ment that some manufacturers were very careful to make for that purpose an ether of low specific gravity containing little or no alcohol.

Professor Trimble read a paper upon *American galls*, which showed that some of these contained notable quantities of tannin.

Professor Maisch said he was gratified to hear this paper, and expressed his opinion that the white oak galls would never become of commercial value; but that the galls from *Quercus virens* or live oak of our Southern States were rich in tannin, and might be of commercial value if obtainable at a reasonable price and in sufficient quantity. It would also be interesting to have the spongy galls of the *Quercus lobata* of California examined; these are of a yellow color, blushed with red on one side, from an inch to an inch and a half in diameter, and contain a colony of insects. Galls are also found on some species of Solidago and other plants. The whole subject is very interesting, and deserving of further and closer investigation.

A paper upon the *growth of the Camphor tree in Florida* was read by Professor Maisch, who also exhibited a little of the crude camphor made by Messrs. A. J. Beach & Co., and sent to Mr. Heinitsh.

Professor Maisch exhibited specimens of the metals *Aluminium* and *Magnesium* made on a large scale by Mr. Wm. Frischmuth, Frankford Avenue, in this city; their remarkable lightness attracted attention, as well as the brightness of the former, and the thinness to which it has been rolled out.

Mr. Beringer had received specimen of a plant from a Virginia physician, which proved to be *Scrophularia nodosa*, variety *marilandica;* some of the roots had numerous tubercles.

Professor Trimble presented a sample of *Cassie* from Georgia, the odor of which is so agreeable that it is largely used as a perfume; but it has the singular property of imparting a strong alliaceous odor to the breath of those who eat it which, while unperceptible to the user, renders his company intolerable to all near him.

There being no further business on motion adjourned.

T. S. WIEGAND, *Registrar.*

EDITORIALS.

The Metric System.—A decree recently issued by the Russian Government directs all students of medicine and pharmacy to thoroughly acquaint themselves with the metric system of weights and measures, it being the intention of requiring, in the course of five years, the writing and compounding of prescriptions according to that system.

The State Pharmaceutical Examining Board of Pennsylvania held an examination in the Central High School, at Philadelphia, on Monday, October 6, and in the College of Pharmacy, at Pittsburgh, on Tuesday, October 7, 1890. One hundred and seventeen candidates applied for Registered Pharmacists' certificates, and eighty for Qualified Assistants' certificates. Forty-eight of the former, and forty-nine of the latter class were successful.

DEC 3 1890

THE AMERICAN
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DECEMBER, 1890.

MICROSCOPICAL AND URINARY NOTES.

By Hans M. Wilder.

Illumination.—Perhaps the most difficult thing to learn, in the application of the microscope, is the proper handling of the light. Through faulty illumination the image of the object may appear distorted, or some of the minute structure may be entirely obliterated, and more than one really excellent objective has been condemned, because—through faulty illumination—it did not do what it was reasonably expected to be able to. What influence the mode of illumination has on the image formed can be shown by examining an object, with the appearance of the minute markings of which we are thoroughly familiar, with a wide or narrow angle of light; central or more or less oblique; with the mirror close to or farther removed from the stage. If we examine, for instance, a slide of potato starch, we shall see the individual starch grains either as solid bodies possessing an appreciable thickness, or as flat oval discs, or as depressed discs (something like soup plates); according to distance of the mirror from the slide, the mode of illumination and a very slight alteration of the focus. The markings will alter their appearance more or less, and at times disappear altogether; although we know that they are there, and that our objective shows them readily.

Outfit.—The following optical battery will be all that 999 of 1,000 pharmacists ever will have any use for. A 1-inch magnifier, 2-inch, ¾-inch and $\frac{1}{5}$-inch objectives, 2 eye-pieces, condenser on stand (bull's-eye) and a polarizing apparatus. These, with a microscope stand, nose-piece, microtome and turn-table will cost, at the lowest,

about $85 to $100, according to quality of the objectives, and whether the stand be provided with sliding-tubes or with a rack and pinion.

For a beginning a magnifier, one eye-piece, a ¾-inch objective and a condenser on stand will be all that is necessary, besides the microscope stand; the lowest price of all of which is about $25 to $30. This will be sufficient for the first six or twelve months, then the remainder can be gradually added, the 2-inch objective being the least necessary objective. Of the apparatus, the nose-piece is of such a convenience that it rapidly becomes a necessity. A microtome (section cutter) can be dispensed with, free-hand cutting serving all useful purposes, though the sections seldom will be elegant. The turn-table is rendered necessary by the use of *circular* cover-glasses. Practically, *square* cover-glasses serve exactly as well, but are not considered as elegant as the circular ones; with these a turn-table is, of course, superfluous.

Objectives.—These are generally divided into three classes: student's, professional and first-class, which *now-a-day* means only objectives with low and medium angular aperture; wide angled; and with the widest angle obtainable. At present the objectives of each class are made and corrected as carefully as possible; some twenty years back, however, the lower angled ones ("student's") were generally poorly corrected, and entirely unreliable for exact investigations. The practical difference between low and medium angled objectives and those of the widest angle is that a wide angled objective shows more of the very minute details and shows them better than a low angled one of the same focus, which often fails to show them at all. Happily for us pharmacists the minuteness of the details in question is far greater than any we have to investigate; the so-called "student's" serve all our purposes, and are very much cheaper. It is an entirely different thing when we want to study the layers of the cell wall, for instance, or bacteria, then we cannot do without objectives of a very wide angle.

Cover-glasses.—The attention of those interested in the influence of the thickness of the cover-glass on the definition and resolution of the object examined, and how to counteract this influence by either shortening or lengthening the draw-tube—is called to an instructive article of Ed. Bausch, in the October number of the "Microscope" (Trenton, N. J.).

Glycerin mounts.—The great trouble with these mounts is that none of the usual cements (for ringing) will stick, unless *all* traces of the glycerin have been thoroughly removed. India-rubber cements or marine glue are not so sensitive; they stick in spite of a little glycerin which may happen to be present.

Silicate of sodium—a retraction.—A couple of months ago the writer strongly recommended water-glass as a medium. He did so, based on one year's experience. On a late inspection of his slides he found that nearly all silicate mounts had become more or less opaque, granular-like. It is a pity—through its quickly setting and strong sticking property, the silicate promised to be an excellent medium.

Urinary deposits.—These can be rendered more conspicuous by adding a few drops of eosine solution (the "carmine ink" of to-day to the urine, and allowing the casts, etc., to settle. (Dr. Jennings.)

Diabetic and albuminous urine.—As it is not always feasible to obtain the necessary pathological urine for (exercise) practice in testing, a very fair makeshift will be found in the following: Dissolve five drops of honey (or glucose) in a couple of ounces of water, and use this solution for practice, diluting it more and more. Shake the white of one egg with one pint of water and add a couple of crystals of thymol for preservation. Use similarly for practice.

A volumetric sugar table for Fehling's or Pavy's solutions, by E. W. Sharp (class of '84), will be found in the *Microscopical Bulletin*, 1890, p. 16.

Preservation of urine.—It has been variously recommended to add a few drops of chloroform, which does not in any way interfere with the testing.

THE KOLA NUT OF AFRICA.

By P. L. Simmonds, F.L.S.

This seed or fruit, known under a variety of names in different parts of Africa, as kola, gourou, ombéné, nangoné, kokkorokon and matrassa, has only within a few years come into important notice as a food stimulant. Twenty or thirty years ago, it was incidentally described by Dr. Daniel and Prof. Attfield, in the *Pharmaceutical Journal*, but its extensive employment in Africa was comparatively little known. Although its use as a stimulant, in the place of coffee, tea, maté and coca by other people, had been very general, almost

from time immemorial among the various tribes of Equatorial Africa, the product was little known in Europe.

The opening up of Central Africa and the increase of trade on the West Coast has demonstrated its importance as a local article of commerce, and its chemical advantages have become duly appreciated. There are, however, two distinct products; one, the true kola nut, the product of *Sterculia acuminata*, popularly known as the female kola, and the false, or bitter kola, designated as the male kola. The true kola tree grows spontaneously over the range of Western Africa comprised between the 10° of N. latitude to the 5° S. latitude. This tree, to which attention has of late years been prominently directed by the authorities of Kew, has been introduced from time to time into India, Ceylon, Seychelles, Mauritius and Cochin China in the East; Zanzibar and Sidney, and in French Guiana, British Guiana, Guadaloupe, Dominica and Jamaica in the Western Hemisphere.

Incidental mention of this nut has been already made in this Journal—1880, pp. 6 and 7; 1883, p. 27; 1884, p. 166, and 1886, p. 391. The tree commences to bear at 4 or 5 years, but it is not until 10 years that it is in full fruit, when it will produce on the average 120 pounds of seed twice yearly. Flowering in June, the pods will ripen in October and November, and a second crop will be yielded in May and June following. The fruits as they ripen have a yellowish-brown color, and, as the central suture opens, exposes both red and white seeds. The women remove the seeds, which are most appreciated and valued when they are fresh and moist. To preserve them, they are placed in baskets, in layers, with the leaves of *Sterculia cordifolia*, which are kept damp. If they are kept, or to be transported any distance, the nuts are washed and fresh moistened leaves added every month. The packages, weighing about 1 cwt., are sent to the Gambia, Gone and other districts. When the nuts become dry, they are reduced to powder, and taken in this state by the caravans to the interior. They frequently arrive, however, in a fresh state at Sokoto and Kouka, in the Soudan, and at Timbuctoo.

Not only are the kola nuts consumed in Africa, but they are also exported to Brazil for the use of the negroes there. The seeds of *Sterculia Chica* and *S. lasiantha* are also eaten in Brazil.

Sierra Leone is the principal market for these nuts. Ten years

ago, about 750,000 pounds of kola nuts were imported there, and 600,000 pounds to the Gambia.

The unerring instinct of man, even in uncivilized countries, has led him to select, from the many thousands of plants presented to him in Nature, just four or five, which, from their alkaloid active principle, theine, seem to be a necessary rather than a luxury of life. These nuts contain more theine (viz, 2·34) than most of the other dietetic products in use. The properties of the nut are said to be two-fold. In the first place, it enhances to many palates the flavor of food eaten afterwards; secondly, it possesses the more important function of staying the cravings of hunger, and enabling those indulging in it to endure prolonged labor without fatigue. Being bitter, they are used as a stomachic and a tonic.

It is beneficial in periodical and chronic headaches, in heart complaints and diarrhœa; and, mixed with cocoa, it has been found a sustaining and stimulating adjunct in exhaustive and wasting diseases. It is said to clarify beer and spirits, and, like the clearing nut (*Strychnos potatorum*), to render drinkable foul water. It is even spoken of as a cure for drunkenness, from the amount of theine it contains. Probably other species of kola or sterculia may furnish seeds equally used if they contain caffeine.

The false kola nut has been named *Garcinia Kola* by Dr. Heckel, but is not yet well defined, although it resembles the Eastern *Garcinia Morella*. These seeds are employed like the true kola nuts, although they have not the same properties, being destitute of the alkaloid. They are contained in a large berry, like an apple, to the number of three or four; oval, cuneiform. They are chewed generally on the West Coast, and have a bitter flavor, like green coffee. They are said to be an effectual remedy for cold in the head, a few seeds being chewed in the course of the day.

Elder Bark as a diuretic.—G. Lemoine of Lille recommends the inner white bark of the European elder, Sambucus nigra, as a valuable diuretic, a handful of the fresh material being boiled in a liter of water, and the decoction administered during the day; it has also a laxative action.

Mites in flaxseed meal and ground mustard multiply rapidly, and render the meal unfit for use. H. David (*Bulletin Commerc.*) recommends the seeds of both, flax and mustard, to be ground fresh for use. The mite is a species of acaridæ, and is known as Tyroglyphus siro. It is also met with upon cheese in company with another species.

SOME INDIAN FOOD PLANTS—CALIFORNIA SOAP PLANT.

V.—Chlorogalum pomeridianum, Kunth.

By Henry Trimble.

Contribution from the Chemical Laboratory of the Philadelphia College of Pharmacy.—No. 79.

Read at the Pharmaceutical Meeting, November 18.

While the above is not strictly a food plant, nevertheless the above title is retained as an appropriate one for the Indian domestic plants.

For the material of the chemical examination, as well as for the following report, I am indebted to Dr. V. Havard, U. S. Army Surgeon, at Fort Buford, N. Dakota:

"This is one of the many showy plants of the California Liliaceæ, and well worthy of cultivation for its beauty.

"Stem stout, scarcely leafy, from a fibrous or membraneously coated bulb, bearing a spreading sparingly 'branched racemose panicle,' 1 to 3 feet high; leaves broadly linear, somewhat fleshy and flaccid, about a foot long and half an inch wide; pedicles short, scattered, bearing white purplish-veined flowers, whose 6 segments are 8 to 10 lines long. The flowers open only after midday, whence the specific name.

"Grows in valleys and foot-hills of the Pacific Coast from Oregon to Central America. In California, it is abundant in places 'from the Upper Sacramento to the Stanislaus, Monterey and Santa Barbara.'

"The ovate bulb is one to four inches in diameter and about four inches in length. The coats of which it is made up are thick and fleshy in the centre, the white-yellowish section exuding a thickish frothy mucus; they grow thinner and drier on approaching the surface, where they become membraneous fibrous, and finally break on the outside into a thick covering of coarse, brownish fibres resembling the coir of the cocoa nut.

"These fibres are light, elastic, of good strength and durable. They have been separated from the bulbs, especially by the Chinese, and used as hair to fill cushions, mattresses, etc., constituting, in places, quite an article of commerce.

"The bulb has for a long time been held in high esteem by Indians and Mexicans for its detergent properties, which make it

an excellent substitute for soap—so efficient and harmless that it is still preferred for washing laces, embroideries and such like delicate fabrics. A cold infusion is advised as dentifrice, shampoo liquid, and a valuable lotion for both face and hands.

"The medical properties of the bulb are unknown, the juice is acrid to the taste, and said to be poisonous.

"The other two species of this genus growing in California have also large bulbs, which probably possess the same detergent properties, but are without the covering of fibres so conspicuous in the above."

The bulbs were freed from the husk-like outer scales, until the white fleshy interior was reached, and this inner portion was cut into small pieces, and in this condition used in the following analysis.

The moisture, by drying to constant weight at 110° C., was found to be 73·13 per cent. and ash 0·70 per cent. No unusual constituents were found in the ash. There were—

	Per Cent.
Soluble in water,	36·50
Soluble in dilute HCl,	62·70
Insoluble silica,	0·80
	100·00

Stronger ether extracted 0·13 per cent. from the moist plant. The extract was reddish brown, crystalline, and of a peculiar odor. The crystals were soluble in water, and removed from it by agitation with ether. They gave negative reactions for alkaloids, but by the peculiar odor developed on heating with HCl and the presence of glucose, a glucoside was indicated. That part of the extract insoluble in water was red, resinous and soluble in alcohol.

The residual plant, after extraction with ether, yielded 4·49 per cent. to absolute alcohol. This extract was dark brown, nearly black, odor resembling chocolate, largely soluble in water, forming a reddish, neutral, frothy liquid, and without reaction toward ferric chloride.

Water extracted from the remaining plant 9·35 per cent., consisting of 0·7 per cent. dextrin, 1·45 per cent. glucose, 0·45 per cent. saccharose and 1·20 per cent. mucilage. The solution was yellow, turbid, frothy, neutral and possessed an acrid taste. The residue

after treatment with dilute alkali and acid amounted to 4·13 per cent., representing cellulose and lignin.

A special determination of saponin showed there were 1·87 per cent. of this substance present, and to this, no doubt, the plant owes its peculiar virtues, since this indicates in the absolutely dry bulb 6·95 per cent., sufficient to account for the frothing tendency of the different watery solutions.

Brief references are made to this plant in this journal, 1876, p. 520, and 1877, p. 569.

THE FLOWERS OF VERBASCUM THAPSUS.

By Edwin L. Janson, Ph.G.

Contribution from the Chemical Laboratory of the Philadelphia College of Pharmacy.—No. 80.

Mullein flowers have recently attracted some attention in medical practice and are extensively employed as a domestic remedy.

The material used in the following investigation was collected by myself near Canton, O. Only the corolla and adhering stamens were used, and were carefully dried so as to retain their natural golden yellow color. A small quantity of the seeds were also collected and a partial analysis made of them. The medicinal properties of the flowers are demulcent, diuretic, anodyne and antispasmodic. The infusion has been used in catarrhal affections of the respiratory organs, and the flowers, when boiled with milk, have been a popular remedy to palliate cough and diarrhœa. The odor of the flowers when fresh is slight, but when dry sweet and honey-like; the taste is mucilaginous and somewhat bitter.

Petroleum ether and stronger ether successively used on the drug extracted about one-half per cent. in each case. Quite a change in the color of the drug was noticed after the extraction with ether. It was at first light yellow, but that solvent removed the yellow color and left the residue of a dark green color. The yellow coloring matter was either a part of, or else it was retained by, the resin dissolved by ether, and it was not found possible to separate it in the pure state. The drug after exhaustion with ether yielded 10·06 per cent. to absolute alcohol.

A considerable portion of this alcoholic extract was soluble in water acidified with hydrochloric acid. When agitated with petroleum ether this acid solution yielded some color to petroleum ether,

and this latter solvent on evaporation left a greenish-brown crystalline mass, of a strong disagreeable odor and a sweet taste; tests with Fehling's solution showed it to be an easily decomposable glucoside. Another crystalline residue was obtained by making the above acid solution, of the alcoholic extract, alkaline and agitating with ether, chloroform extracted from the same solution, after the agitation with the other solvents, a red-brown amorphous mass.

Both of these residues reduced Fehling's solution, and many changes in color were noticed, indicating that these substances take some part in the coloring matter of the flowers.

The drug was also found to contain 2·49 per cent. of mucilage, 11·76 per cent. of carbohydrate corresponding to dextrin, 5·48 per cent. of glucose, 1·29 per cent. of saccharose, 16·76 per cent. of moisture, 4·11 per cent. of ash, and 32·75 per cent. of cellulose and lignin. No reaction indicating tannin was obtained with iron salts, but an aqueous solution of the alcoholic extract yielded a slight precipitate with gelatin.

The seeds which were also collected and examined are small, about $\frac{1}{25}$ of an inch in length, cone-shaped, finely pitted, very tough, difficult to powder, nearly inodorous, and possessing a somewhat acrid taste; they are said to be narcotic, and to have been used in asthma and infantile convulsions.

They yielded to petroleum ether 20·75 per cent. of a bright, green fixed oil. The acrid principle was obtained from the alcoholic extract soluble in water, by agitating with petroleum ether. The moisture was determined to be 10·86 per cent., and the ash 3·90 per cent.

SOLANUM CAROLINENSE (*Linné*).

By G. A. Krauss, Ph.G.

Read at the Pharmaceutical Meeting of the Philadelphia College of Pharmacy, November 18.

This perennial herb grows in abundance in the Southern States along the roads and in dry places, and reaches a height of nearly 2 feet. The root is thin, has a thick bark and attains a length of from 1½ to 2½ feet, descending vertically. The stem is erect; the leaves are broadly oblong, sinuate, serrate, and their mibrid, as well as the stem are beset with numerous prickles. The flowers are rather large with a united 5-cleft corolla, and a calyx con-

sisting of 5 sepals; 5 stamens and a prominent pistil with one stigma. It flowers from June till September. The fruit is a berry about ½ inch in diameter, and contains numerous seeds around a central placenta.

My attention was first called to this plant through the complaints of farmers who had experienced considerable loss among their horses and cattle. The farmers claimed that the animals die suddenly with poisonous symptoms. Examining some of their pastures, I found an abundance of Solanum carolinense and plain evidence that the animals had fed on it.

I commenced investigating the composition of the plant and have just finished the root part (leaves and fruits are under examination); the results obtained may induce further investigation in this direction.

I. THE ROOT BARK.

As stated above, the root is thin but very tough. The bark is thick and in the fresh state fleshy. On drying the bark separates easily from the inert wood. The samples for examination were collected by the author during the fall.

Petroleum ether extract:

	Per Cent.	
Alkaloids,	0·085	
Volatile oil,	0·120	
Fat,	0·730	
		0·935

Ether extract:

Alkaloids,	0·025	
Resin soluble in alcohol,	0·185	
" " ether,	0·025	
		0·235

Alcohol extract:

Alkaloids (Solanine),	0·285	
Resin soluble in ether,	0·245	
" " alcohol,	0·020	
		0·550

Aqueous extract:

Mucilage,	0·560	
Dextrin,	1·280	
Albumen,	0·600	
Glucose,	1·770	
Saccharose,	0·750	
Extractive and undetermined,	3·520	
		8·480

Caustic soda extract:

Albuminoids,	5·145	
Not precipitated by alcohol,	4·160	
		9·305

Hydrochloric acid extract:

Oxalate of lime,	1·205	
Starch,	6·150	
		7·355
Incrusting matter, cellulose, etc.,	53·450	
Moisture,	8·590	
Ash including sand,	10·800	
Loss,	0·300	
		100·000

From the analysis it will be observed that but little is extracted by petroleum ether, ether and alcohol, and that the root bark contains comparatively large amounts of albuminoids and starch.

The ash contained besides calcium, potassium, iron and sulphuric acid, a large amount of sand, which must have adhered to the root, notwithstanding its careful treatment.

The total alkaloids amounted to about 0·4 per cent. The alkaloids extracted by petroleum ether and ether differed in some reactions from the one dissolved by alcohol. The separate alkaloidal extractions behaved identically with the following reagents:

Mayer's solution gave a white flocculent precipitate; mercuric chloride gave a white flocculent precipitate; iodine gave a brown precipitate; chloride of gold gave a yellow precipitate, with gradual reduction of metallic gold.

The alkaloids were crystallizable and dissolved in dilute acids, from which ammonia precipitates them again.

Sulphuric acid spec. grav. 1·84, produces a fine red color.

Heated on platinum they emitted an odor of burning hair, leaving no residue.

The alkaloids differed as follows:

(*a*) The alkaloids extracted by petroleum ether and ether did not reduce Fehling's solution, even after having been boiled with dilute acids. They were soluble in benzol and chloroform. They crystallized in hard shining prisms and their solutions did not gelatinize. The precipitate with Mayer's solution was wholly dissolved by ether, which on evaporation left a residue of crystals of ¼ inch length. These crystals were dissolved in alcohol, H_2S passed through the solution, HgS removed by filtration, and the

liquid tested for glucose with no reduction of copper, showing that no decomposition had taken place.

(*b*) The alkaloid extracted by alcohol crystallizes in needles. It did not reduce Fehling's solution when pure; but it did so promptly after having been boiled with dilute HCl. An acid solution of this alkaloid gelatinizes on standing over sulphuric acid. Within this mass fine needles were observed. Their taste is bitter and somewhat burning, and the mass dries up to a brown, horny mass. The alkaloid did not dissolve in petroleum ether, but was slightly soluble in ether, not at all in water and easily in alcohol. The precipitate with Mayer's solution was dissolved in alcohol, H_2S passed through the solution and HgS removed by filtration. The remaining liquid promptly reduced Fehling's solution, showing that with this alkaloid decomposition had taken place.

Owing to the small amount of material (300 gm.) on hand, and the advanced season, I was unable to obtain sufficient alkaloids to make an ultimate analysis, but intend to do so next year.

From the above it appears probable that the alkaloid extracted by petroleum ether is identical with the one extracted by ether, while it appears most certain that the one extracted by alcohol is identical with solanine.

According to Zwenger (Dragendorff, Gerichtlich-Chemische Ermittelung d. Gifte, p. 262) and O. Gmelin (Gmelin's Handbook, vol. 15, p. 349, Cavendish Society) solanine splits up into solanidine and glucose on boiling with dilute acids. Its solution gelatinizes, and it gives a red color with H_2SO_4. All these reactions have been obtained with the alcohol soluble alkaloid.

Whether the petroleum ether and ether soluble alkaloids are identical with solanidine, or whether they contain a new alkaloid, I shall endeavor to investigate as soon as I have procured sufficient supply of the drug.

That the alkaloids are combined with an acid must be certain from the following experiment: 100 gm. of powdered root bark were exhausted by alcohol, and the latter distilled off in a vacuum; water dissolved from the nearly dry extract all the alkaloids, and ammonia precipitated them from this solution, the liberated alkaloids not dissolving in water.

Laboratory, Mansfield Drug Co.,
Memphis, Tenn., Nov., 1890.

RESIN OF PODOPHYLLUM AND PODOPHYLLIN.

By J. U. Lloyd, Cincinnati.

(*Continued from page 388.*)

Discussion over the name Podophyllin.—Prof. King was numbered among those who advocated the designation "Resin of Podophyllum," which was the name he first gave it and employed in its introduction.[1] Although he finally acquiesced and accepted the popular name "*podophyllin*," making that expression the prominent name in the first edition of his Dispensatory (1852), he supplemented it by calling the drug "a resin to which the name of podophyllin has been given." From 1840 to 1855 considerable controversy, accompanied by some acridity, was exhibited in the eclectic ranks in connection with the subject of "resinoids" and their names, as shown in the current pages of the Worcester Journal of Medicine (Worcester, Mass.), the Western Medical Reformer (Worthington, O.), the College Journal (Cincinnati, O.), and the Eclectic Medical Journal (Cincinnati, O.), but this controversy is probably not familiar to persons unacquainted with the actors and the early eclectic literature connected with the subject. The late Mr. Wm. S. Merrell, of Cincinnati, who first used the term *podophyllin*, ably defended that name. In reply to critics he called attention[2] to the fact that the names for *jalapin* and several other similar bodies, which were not definite chemical compounds, were named after that plan, and he finally informed his antagonists that he had actually accepted the name (to use his words) suggested by "Prof. Wood, the author of the United States Dispensatory, who is no mean authority." Mr. Merrell then continued his argument by saying that "the names of the resinous principles or resinoids, should be made to terminate in *in*, after the analogy of the generic substance resin or rosin, and accordingly we should write *Podophyllin*, *Macrotin*, *Jalapin*, etc." The method was accepted by Hill (Cincinnati) and Kieth (New York), the other makers of eclectic remedies at that period, and each placed a limited line of "resinoids" upon the market. They accepted without question the nomenclature that Mr. Merrell had established, although, in eclectic literature, some very acrimonious discussions appeared con-

[1] *Western Medical Reformer*, April, 1846.

[2] *Eclectic Medical Journal*, July, 1850, p. 299.

cerning the drugs to which the names were applied.[1] The foregoing view of those terms finally prevailed among all Eclectics, and became established firmly in the drug trade, and, as before remarked, when the (more or less) resinous precipitate obtained from Podophyllum peltatum finally demanded recognition in the United States Pharmacopœia, it came before the revision of that work as an eclectic drug under a name formulated by the editors of the United States Dispensatory that had become argumentatively established as the universal appellation.

Introduction to the U. S. P.; Resina Podophylli.—The substance under consideration, as before stated, was the first member to obtain popularity in the list of eclectic "resinoids." Through the influence of Professors King, Hill, Morrow, and other contributions to eclectic literature, the drug had quickly assumed a position and importance perhaps seldom attained by vegetable remedies within so short a period. Its unquestioned efficacy as a cholagogue cathartic established it in the practice of the eclectic medical profession, to whom it appeared in the heat of their controversy over the abuse of the mercurial preparations that were then so extensively employed in regular practice, and it was hailed by eclectics as a vegetable substitute for the mercurials, and even called the "Eclectic Calomel." Before its character was understood to the leaders in the Regular School, it became, as has been stated, under the name *podophyllin*, perhaps the most prominent of eclectic drugs. Such conspicuity as it enjoyed in their ranks could not, however, exist with reference to a drug used so extensively in Eclecticism without recurring introductions to members of the Regular School, and, in consequence, it came into general repute with numbers of their general practitioners before it had been recognized authoritatively by any of their bookmakers. Thus it happened that commercial "*podophyllin*" became a valued drug in general, regular practice years before it received recognition, either in the United States Pharmacopœia or Dispensatory. Hence, when at last it was deemed advisable to give a position in the Pharmacopœia to this drug, which had long been known to be of unquestioned value, it was found that its "eclectic" name *podophyllin*, had become established at home and abroad.

Probably unaware of the record in Eclecticism—at least, without

[1] These discussions, being confined to eclectic publications, are unknown to most persons, for few students have that literature at command.

recognition of that fact—the controversy or discussion over the name was resuscitated and continued when the drug knocked at the door of the U. S. P. As early as 1851, however,[1] the late Edward Parrish had recognized the advent of these products (Resinoids or Concentrations) of "Eclectic Pharmacy," and deprecated their names. He said: "As well might the Calisaya Extract of Ellis be called *quinia* as the impure resinoid substance precipitated from a tincture of mayapple, by the above process, *podophyllin*." This argument, however, failed to impress either the makers or consumers of "*Podophyllin*," and when it became officinal in the United States Pharmacopœia (1860) as "Resina Podophylli" the title of the commercial drug remained unchanged. This fact was commented upon by Dr. Squibb, in 1868.[2] He considered it "unfortunate that those whose aim should be to give accuracy and precision to matters connected with medical science and art should so commonly refuse to this substance its proper and correct name, and adhere to the inaccurate and otherwise objectionable name of podophyllin." He severely criticised the names affixed to the class (Resinoids or Concentrations) of which Podophyllin was a member, stating that the termination *in* was "applied to this and other substances by the Eclectics through ignorance of its true nature. It is a resin proper," he continued, "and there seems no good reason for miscalling it by an incorrect name which has attained an equivocal popularity, and the common pronunciation of which is so vulgar and inelegant."

Notwithstanding this stinging criticism, supported indirectly by the writings of other talented and enthusiastic leaders who, in regular medicine and in pharmacy, confined themselves to the officinal appellation, and threw their influence in the direction of the name that was accepted without question as being the only scientific and proper one, little impression seems to have been made on either those who manufactured or consumed the drug. The United States Pharmacopœia, in each subsequent revision, has made the name "Resina Podophylli" officinal; the influence of the majority of the instructors has been continuously added thereto; but with so little effect, that in commerce when the drug is specified, and when it is prescribed by physicians, the appellation is usually podophyllin.

[1] Am. Jour. Pharm., 1851, p. 329.

[2] On the Preparation and Use of Resin of Podophyllum, Am. Jour. Pharm., 1868, p. 1.

NOTES ON THE DETECTION OF SILVER SALTS IN SOLUTIONS CONTAINING MERCUROUS SALTS.

By Frank X. Moerk, Ph.G.

Contribution from the Chemical Laboratory of the Philadelphia College of Pharmacy.—No. 82.

The method of detection of these two salts in qualitative analysis depends upon the precipitation first of the chlorides by hydrochloric acid and then treating the washed chlorides upon the filter with water of ammonia, the mercurous salt being indicated by a blackening of the precipitate, while the silver chloride dissolves and is reprecipitated by addition of nitric acid. If the black residue representing the mercurous salt be heated with nitric acid, the mercurous salt is converted into mercuric salt which, after diluting with water, is not precipitated by addition of hydrochloric acid.

Examining a solution containing about one per cent. of silver nitrate with mercurous nitrate, it was found that after acidifying the ammonia solution with nitric acid, only the faintest turbidity was produced, whereas from a one per cent. silver nitrate solution could be expected a copious precipitate; it did not matter how often the ammonia solution was returned to the filter and allowed to run through again, the turbidity of the acidified solution was not perceptibly increased, nor did loosening the precipitate from the sides of the filter alter the result. Boiling the residue of the ammonia treatment with nitric acid for several minutes, diluting with water and adding a little dilute hydrochloric acid gave a decided precipitate, which, collected upon a filter after washing, was easily soluble in ammonia and then reprecipitated by addition of nitric acid.

The probable cause is that the precipitated mercurous chloride surrounds the precipitated silver chloride and prevents the solvent action of the ammonia.

A solution containing silver nitrate, lead nitrate and mercurous nitrate was found to give the test for silver without the above difficulty.

Further experiments will be made to ascertain the proportions of the two salts necessary to give the above results.

Bromoform has been used in whooping cough by Dr. Neumann (see also this volume pp. 89 and 405) in doses of 3 to 5 drops, suspended in syrup, and frequently repeated. It reduces the number of paroxysms and appears to cut short the disease.—*Therap. Monatsh.*, July, 1890.

TESTS FOR HYPOPHOSPHITES.

By Frank X. Moerk, Ph.G.

Contribution from the Chemical Laboratory of the Philadelphia College of Pharmacy.—No. 81.

As stated in an article upon "The Estimation of Hypophosphorous Acid and the Hypophosphites,"[1] there are three tests obtainable with this acid and its salts, which are said to be characteristic: (1) The cuprous hydride precipitate changing upon boiling into metallic copper and hydrogen, this test answering only in comparatively concentrated solutions; (2) the blue color or precipitate with acid solution of ammonium molybdate after the addition of a few drops of sulphurous acid; (3) the blue color with tungstates under the same conditions. The last two tests are obtainable in dilute solutions. The molybdate test, according to E. J. Millard,[2] is best applied as follows: "To a solution of hypophosphorous acid or any of the hypophosphites the acid solution of ammonium molybdate is added, and then a few drops of sulphurous acid; a blue precipitate is immediately formed, or, if the solution be dilute, a blue coloration is produced which is considerably intensified by agitation or gentle warming." Millard further states that H_2S and $SnCl_2$, as reducing agents, do not give the reaction because they carry the reduction too far, namely, to the brown state. Of salts interfering with the reaction, he says: Chlorates prevent it, sulphides produce a brownish-black precipitate that would completely hide it, and thiosulphates reduce the molybdate to the brown state.

For several years prior to the publication of the above, it was noticed in the Chemical Laboratory of the College that students *occasionally* obtained a blue color with ammonium molybdate in a solution containing thiosulphate; although I often made the test with the same solutions and *occasionally* obtained the blue color; still the number of times I was successful in this bears a very small ratio to the number of times I was unsuccessful, even though the reagents were added in the same quantities and in the same order.

After a large number of experiments, the difficulty in always obtaining the blue color was found to be due to the excess of nitric acid present in the solution of ammonium molybdate; for if the

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[1] Am. Jour. Pharm., 1889, 326.

[2] *Pharm. Journal*, Jan. 26, 1889. Reprinted in Am. Journ. Pharm., 1889, 129.

greater part of the nitric acid be neutralized by addition of ammonia the test succeeds with thiosulphate even in the cold. With this slightly acid ammonium molybdate solution, it is possible to obtain a faint blue color with sulphites; this, however, shows best by adding a slight excess of ammonia after warming the mixed sulphite and molybdate solutions. It may be stated here that this faintly acid solution does not give the *hypophosphite* test as readily or as nicely as the more acid commercial solution; using this strongly acid ammonium molybdate solution, the test for hypophosphites can be so modified that sodium sulphite solution, or even a small quantity of thiosulphate solution, may be used in place of sulphurous acid.

In repeating the tests made by Millard, it was found that *stannous chloride*, in moderately dilute solution, *invariably* gave a very fine blue color, with the commercial molybdate solution; the same test carried out with a concentrated solution of stannous chloride added in considerable quantity, gave at first a brownish solution, changing on standing to a greenish-blue. It was also found that ammonium molybdate added to complex solutions containing stannous chloride produced a blue color.

From the above, it will be seen that several reducing agents besides hypophosphites have the power of reducing molybdic acid to the blue state, but that only the stannous chloride will do it under the same conditions as the hypophosphites. Millard states in the presence of sulphides, thiosulphates and chlorates the test for hypophosphites may be obtained after these salts have been decomposed by boiling with dilute hydrochloric acid. This is correct as far as the sulphide and thiosulphate are concerned, but the chlorate boiled with hydrochloric acid liberates chlorine which oxidizes rapidly the hypophosphite to phosphate, and then a yellow precipitate is obtained when the molybdate solution is added. In solutions containing stannous chloride this latter is not changed by boiling with hydrochloric acid, and hence the solution after boiling will give the blue color with ammonium molybdate, although no hypophosphite is present.

Considerable interest was excited after the above results were obtained, as to the behavior of sodium tungstate (also given by Millard as a delicate test for hypophosphites) towards the substances giving, under the proper conditions, similar tests with the

molybdate. It was found that thiosulphate and sulphite alone give no blue color, and stannous chloride produces only a greenish color or precipitate. Hence, of the two tests, this one appears to be the most characteristic of hypophosphites. To obtain this test the solution of sodium tungstate in distilled water (1 : 100) is acidified (rather strongly) with nitric acid, then the hypophosphite and sulphite solutions added and moderately warmed; the blue color resembles that of Fehling's solution and more rapidly intensifies than the corresponding test with molybdate. Experiments made to ascertain how delicate these two tests were proved that solutions containing one part calcium hypophosphite in 5,000 parts of water still gave very distinct blue colorations; in this dilution the molybdate test is frequently obtained of a greenish-blue color, while the tungstate is a very fine blue; solutions containing one part in 10,000 parts of water failed to respond. Millard does not find the molybdate test quite as delicate, he stating that one part in 2,000 can still be detected; in mixtures he finds 1 in 300 to be the limit.

Experiments were next made to ascertain if it was possible to detect with both the molybdate and the tungstate tests the hypophosphite in presence of the interfering salts, sulphides, thiosulphates and chlorates. Solutions containing one per cent. of these salts were mixed with equal volumes of a solution containing 0·1 per cent. of calcium hypophosphite, so the solution contained hypophosphite 1 : 2000 and 10 : 2000 of the other salts. The *chlorate* prevented not only the molybdate but also the tungstate test for the hypophosphite (even in solutions containing one per cent. each of chlorate and hypophosphite); as previously stated, by boiling such a solution with hydrochloric acid, the hypophosphite is completely and rapidly converted into phosphate. After numerous experiments, the following procedure allowed the detection of the hypophosphite: To the mixture of chlorate and hypophosphite an equal volume of one per cent. sodium tungstate solution is added, then a crystal of sodium sulphite and nitric acid to acid reaction (should the odor of SO_2 disappear, another crystal of Na_2SO_3 must be added); on slight warming the blue color develops; the blue color is as fine as though obtained from a pure hypophosphite solution. This test is probably successful because the liberated chloric acid or its decomposition product oxidizes first the SO_2 without acting upon the hypophosphite and, hence, the caution that the odor of SO_2 must be apparent before warming.

The blue, or sometimes a greenish-blue, color is also obtainable from this mixture of chlorate and hypophosphite with the ammonium molybdate test if applied as above; in this test, using the strongly acid solution of ammonium molybdate, the final addition of nitric acid is not necessary.

A mixture of *thiosulphate* (10 : 2000) and *hypophosphite* (1 : 2000) with tungstate of sodium gives a blue color slightly interfered with by the precipitation of sulphur. With the molybdate test it is best to first boil with HCl until the odor of SO_2 disappears; the solution of above strength will still give a blue or greenish-blue color.

A mixture of *sulphide* and *hypophosphite* can be tested as follows: Add to the mixture crystallized sodium sulphite and dilute nitric acid until the odor of SO_2 is permanent (the evolved H_2S reacts with the SO_2 to form S and H_2O, so that when the odor of SO_2 becomes permanent all of the H_2S has been decomposed), then add an equal volume of the molybdate or tungstate solution, and apply moderate heat. The precipitated sulphur does not prevent the blue color appearing in solutions containing as little hypophosphite as 1 in 2000.

In the presence of *stannous chloride* the molybdate test is not available; the tungstate test applied in the following manner will detect hypophosphites in solutions containing 0.05 per cent. To the mixture add a crystal of Na_2SO_3, then acidify with nitric acid, add an equal volume of sodium tungstate solution (one per cent.) and warm; the blue color will slowly develop.

This last method of procedure is, I believe, the one leading to best results in detecting the hypophosphites either in simple or complex solutions.

GLEANINGS FROM THE GERMAN JOURNALS.

By Frank X. Moerk, Ph.G.

The glycerin test of the new German pharmacopœia, in which 1 cc. of glycerin boiled with 1 cc. water of ammonia and three drops of silver nitrate solution should produce no change, has been the subject of considerable writing in the German pharmaceutical press, the writers finding few samples that stand the test if the mixture be boiled for several minutes, whereas if the heating be done in a water-bath most of the samples respond properly. Dr. Bruno Jaffé calls

attention to the fact that only *decolorized* glycerins (not purified by distillation) will comply with the pharmacopœial test; these glycerins contain most of the impurities of the crude glycerin. After this discovery, to samples of distilled glycerin were added several per cent. of arsenious oxide, and these samples then submitted to the test; it was found that they complied with the test and, hence, the deduction that the test is of no service in the detection of arsenic in glycerin. The cause of this is ascribed to the use of such a large excess of ammonia, Dr. Jaffé stating that with a large excess of ammonia *all* samples of glycerin will fail to show any reduction, while if an excess of glycerin be used, *all* samples will reduce ammoniacal silver nitrate; as long as by the presence of a sufficient quantity of ammonia the boiling point of the mixture be kept sufficiently low, no reduction will take place; if, by boiling, a portion of the ammonia be vaporized the boiling point rises, finally reaching such a temperature at which reduction will take place under all conditions. Using a sufficient excess of ammonia, formic acid, arsenious acid and aldehyde will also fail to reduce silver nitrate.—*Chemiker Ztg.*, 1890, 1,493.

Morphine salts and cherry-laurel water.—The appearance of a precipitate in a freshly-made solution of morphine hydrochlorate in distilled cherry-laurel or bitter almond water has been frequently noticed; the precipitation has been explained in various ways: (1) Decomposition of the solution by light; (2) by the glass vessels giving up alkali to the solution; (3) by action of micro-organisms, and (4) by the use of magnesia in making the medicinal water (Am. Journ. Pharm., 1890, 163). Theodor Salzer recently found the precipitation in one case at least to be due to the distilled bitter almond water containing considerable quantities of ammonium cyanide, a constituent of the bitter almond water first noticed by Linde. Salzer found 10 cc. of the water to contain sufficient of this *normal* constituent to precipitate 0·4 gram morphine. The water used in making this bitter almond water was free from ammonia.—*Pharm. Ztg.*, 1890, 669.

Caoutchouc solutions may be readily made by adding to the solvents, benzol, carbon disulphide, etc., certain volatile oils, especially eucalyptus oil. Mixtures containing 96 to 92 parts benzol and 4 to 8 parts eucalyptus oil, or 95 parts carbon disulphide and 15 parts eucalyptus oil will easily dissolve 16 to 20 parts of caoutchouc. It

is preferable to allow only the vapors of these mixture to come in contact with the caoutchouc, as the latter in dissolving will leave the impurities.—W. Lascelles (*Bayr. Gew. u. Ind. Bl.*), *Pharm. Centralhalle*, 1890, 654.

Methylal, on account of its low boiling point, 42° C., and its easy volatilization, is coming into use in the extraction of volatile principles, especially in the extraction of perfumes. Experiments made with violets prove its success in extracting delicate odors.—*Chemiker Ztg.*, 1890, 1474.

Detection of biliary pigments in urine.—To 4 or 5 cc. of slightly warmed urine 5 to 10 drops tincture of iodine are added, agitating after the addition of each drop; in the presence of biliary pigments a pretty olive-green coloration is produced. Excess of tincture of iodine will produce a dirty brown-red color; normal urine at first decolorizes the iodine solution, then gives a red coloration, and on addition of an excess of iodine a dirty brown-red color.—S. Kathrein, *Pharm. Post*, 1890, 845.

New Synthesis of Indigo.—In the *Chemiker Zeitung*, of October 1, L. Lederer publishes a simple method by which this valuable dye can be obtained: 2 grams anilido-acetic acid are slowly added, with stirring, to 8–10 grams fused sodium hydrate; the fusion, at first, of a pale yellow color, is continued until a pure orange color is obtained. The cooled mass, by dissolving in a large quantity of water, separates the indigo. In the same journal, of October 8, K. Heumann, apparently independent of Lederer, discovered the same synthesis. What Lederer calls anilido-acetic acid is called by Heumann phenylglycocoll ($C_6H_5NHCH_2COOH$); one part of this compound is heated with two parts sodium or potassium hydrate; at 260° C. the fusion, with effervescence, assumes a dark orange color. The fusion dissolved in water, without access of air, produces a yellow solution; exposure to air, passing a current of air through the solution, or addition of ferric chloride and hydrochloric acid, will cause the precipitation of indigo. Heumann has applied for patents and transferred all rights to the "Badische Anilin- und Sodafabrik."

Examination of tragacanth.—According to the German pharmacopœia, tragacanth mucilage (1 : 50) should assume a yellow color with solution of soda. L. Reuter finds that this coloration is not produced in the cold, but rapidly if the mixture be heated for a few

seconds in a water bath. Thinking that tragacanth of yellowish color, which gives the reaction more readily, contained a yellow principle giving the test, samples of tragacanth, white and yellow, were extracted with 91 per cent. alcohol. The residue from both was of a decided yellow color, containing fat, a bitter principle and a variety of sugar, but did not deepen in color on addition of NaOH. The tragacanth after treatment with alcohol acted towards NaOH just as the tragacanth before such treatment.—*Apotheker Ztg.*, 1890, 644.

Substitute for gum arabic.—A decoction of linseed with dilute sulphuric acid and water (1 : 8 : 8) at first is quite mucilaginous, but later becomes rather limpid; if at this point it be strained and to the strained liquid four volumes of alcohol added, a precipitate is obtained which, after washing with alcohol and drying, forms a clear gum without color and taste.—(*Dingler's Polytechn. Journ.*), *Apotheker Ztg.*, 1890, 639.

Gelatinizing of digitalis infusions.—A study of this change frequently noticed in the infusion leads to the following conclusions: (1) Digitalis collected at different periods does not show any differences. (2) The petioles are richer in pectinous substances than the leaf itself. (3) By prolonged heating of the infusion the pectin is so modified that by the action of micro-organisms (from the air) fermentation sets in, especially in the presence of sugar, which causes the gelatinizing of the infusion. (4) Gelatinizing does not take place if the directions of the Pharmacopœia are followed, especially if leaves used be freed from the petioles.—Dr. Forcke (Cæsar & Lorenz), *Pharm. Centralhalle*, 1890, 626.

Estimation of Acetanilide in Phenacetine.—The method is based upon the different solubilities of the two in water. If one grain acetanilide be agitated for one-half hour with 200 cc. distilled water at the ordinary temperature a clear solution will result; if phenacetine be treated in the same manner only 0·13 grain will dissolve. In mixtures of the two treated as above, to the insoluble part is added 0·13 gm., the sum indicating the phenacetine present in the mixture, while the acetanilide is obtained by difference.—Dr. H. Will, *Apother. Ztg.*, 1890, 652.

Detection of adulterated bees-wax.—The method of the German pharmacopœia is as follows: 1 gm. wax with 10 cc. water and 3 gm. sodium carbonate is heated to the boiling point for 15 minutes;

after cooling, the wax separates above the liquid, which should be only opalescent. In the presence of Japan wax, stearic acid or resin, the wax forms with the soda solution an emulsion, from which, after even a day's time, the wax does not separate, nor does the solution become almost transparent. Dr. H. Röttger states that tallow also prevents the separation of the wax and the obtaining of an almost transparent solution; mixtures which he made would indicate that 2 per cent. Japan wax, stearic acid or resin could be detected by an abnormal emulsion; tallow could only be detected if 5 per cent. or more was present.—*Chemiker Ztg.*, 1890, 1474.

ABSTRACTS FROM THE FRENCH JOURNALS.

TRANSLATED FOR THE AMERICAN JOURNAL OF PHARMACY.

PREPARATION OF SYRUP OF TOLU.—M. Barnouvin (*Répert. de Phar.*, Nov. 10), reviews the various causes to which, from time to time, have been attributed the disagreeable benzinic odor often noticed in tolu preparations which have arrived at a certain age. After a good deal of experimentation, he concludes that the change arises either from the use of too much heat in the preparation of the syrup, or from the use of an indifferent quality of tolu. With too much heat, as in using an open fire instead of the water-bath, as directed by the Codex, a certain amount of dry distillation goes on which produces a small quantity of toluene; hence the benzinic odor. Concerning the other cause cited, M. Barnouvin says: "Balsam of tolu of inferior quality, which is poor in cinnamic acid, may undergo this transformation, and I have observed dry, friable samples to be almost deprived of balsamic constituents. Such a balsam, under the influence of heat, is transformed into a soft, resinous mass well calculated to retain caloric. This is the more exposed to the modification cited, from the fact that, being poor in aromatic principles, long exposure to heat is necessary for preparation."

A DIGITALIN MIXTURE was prepared by M. Carles, at the request of several physicians; his formula is: Chloroformic digitalin of the Codex, 20 mgm.; alcohol, 60 per cent., 10 gm.; chloroform water, 90 gm. The digitalin is triturated with a small quantity of white sugar; the alcohol is then added, and, afterward, the chloroform water. To get an immediate, complete and stable solution the above order of mixing must be strictly adhered to. Each teaspoonful of the mixture will contain 1 mgm. of digitalin. It keeps

well and for a long time. If sweetening is necessary, a portion of the chloroform water may be replaced by simple syrup.—*L'Union Phar.*, October.

Doses of Exalgin.—In a communication to the *Académie de Médecine*, Oct. 7, Dr. Desnos said that the first doses of this substance should be limited to 25 cgm. each, to be repeated three or four times daily. The daily quantity may be increased progressively to 1·50 or 1·75 gm. The author thought exalgin excellent in facial, anæmic, syphilitic and visceral neuralgias, nephritic colic, neuralgia of the limbs and muscular neuralgia, but of little service in cephalalgia (diffuse), migraine and articular rheumatism.

Pyridine in Blennorrhagia.—Rademaker's formula is: Pyridine, 6 to 8 drops; distilled water, 90 gm. According to the statement of the author, one urethral injection of this mixture daily, for 3 or 4 days, cures the condition. Dr. Rademaker says that pyridine is the most efficacious agent against blennorrhagia now known.—*La Terapia Moderna*, iv, 1890, 335.

Death from Colchicine.—Dr. Sprega, *Gaz. degli Osp.*, Oct. 1, cites the case of the death of a woman for whom a pharmacist dispensed colchicine instead of cotoine.

Aconitine Poisoning.—At the October meeting of *Soc. de Méd. et de Chir. de Bordeaux*, Oct. 10, Dr. Vergely cited a case of intoxication in a patient who was taking 2 to 3 granules, daily, of Duquesnel's crystallized aconitine. The man's condition became disquieting, but he did not succumb. Drs. Arnozin, Mandillon and Moreau cited cases of the same symptoms and results following the ingestion of granules, containing 1 to 1¼ mgm. of the same preparation.

Examination of Iodoform Gauze.—"It is well to assure ourselves that iodoform gauze contains no coloring matter, which, while making it more attractive to the eye, injures its quality. Gauze treated with ether gives up all of its iodoform, and should become white. In solutions of caustic soda a good iodoform gauze holds its yellow color, while the dyed article turns gray, reddish or chestnut."—M. Peccatt in *Répert. de Phar.*, Nov. 10.

Alterability of Diuretine.—This substance is decomposed by all acids, even carbonic acid. Exposed to the air it becomes partially

insoluble, making it necessary to treat it with caustic soda. Even in solutions, carbonic acid acts upon diuretine, and the mixtures become cloudy on account of the precipitation of theobromine. Not only weak acids, but such salts as the biborates, bicarbonates and dimetallic phosphates decompose diuretine; hence, we cannot use it with fruit syrups, or with soda bicarbonate. There is no advantage in giving theobromine transformed into diuretine, since, on reaching the stomach, it is decomposed by the gastric juice. It would be preferable to give theobromine in cachets, or by enema. M. Lambert, *Jour. de Ph. et de Ch.*, Oct. 15.

Examination of an Intestinal Product.—M. Balzer, a pharmacist of Blois, writes to the *Répert. de Phar.*, of Nov. 10, that a patient, on the advice of several physicians brought to him an intestinal product for analysis. It consisted of a brownish strip of mucoid substance measuring 80 x 3 centimetres. An examination with the microscope showed some sparse epithelial cells, a small quantity of blood globules and some of the detritus of digestion. Treatment with ether, and evaporation gave a somewhat abundant residuum of fatty matter, and on calcination it yielded a very small quantity of ash. All of the substances were confined in a sort of net-work, apparently formed of incompletely digested albuminous matter. Evidently this substance was unlike blood serum; like egg albumen it was coagulable with ether, which would have been impossible after a commencing putrid decomposition, that is, after ammoniacal alkalinization. Hence, it was concluded that the substance had been secreted by the intestinal glands, and had become detached, carrying away a thin mucous layer, whose separation had given rise to a slight hemorrhage.

NOTES ON THE VULCANIZATION AND DECAY OF INDIA-RUBBER.[1]

By William Thomson, F.R.S.Ed., F.C.S.

Under ordinary conditions india-rubber for vulcanizing is usually mixed with sulphur and heated to a high temperature, when chemical combination takes place between the sulphur and the rubber, producing a much more valuable compound for ordinary purposes than unvulcanized rubber; the former remaining soft at very low

[1] Read before the British Association, Leeds Meeting, Section B. Reprinted from *Chem. News*, Oct. 17, 1890, p. 192.

temperature and firm at high temperatures, whilst the latter becomes hard and quite plastic respectively at those temperatures.

In making cloth for water-proof garments another method is employed for vulcanizing the rubber, viz., by wetting its surface with a mixture of somewhere about 5 to 10 parts of chloride of sulphur dissolved in 100 parts of bisulphide of carbon, and then heating the fabric gently to evaporate away the excess of these substances. The rubber-covered cloth cannot be heated to a high temperature like the rubber alone, because the heat would be liable to injure the cotton, silk or wool of the fabric, or destroy or injure the colors.

The bisulphide of carbon softens and penetrates the fine layer of rubber, carrying with it the chloride of sulphur dissolved in it, and it is generally supposed that the chloride of sulphur breaks up the sulphur combining with the rubber, producing vulcanization, and the chlorine combining with the hydrogen producing hydrochloric acid, which is liberated. This reaction is clearly not the correct one, and it is probable that the reverse is more in accordance with the facts—viz., that the chlorine of the sulphur chloride combines with the rubber, producing vulcanization, leaving the sulphur in the free state or only partially in combination with the rubber, because in rubber vulcanized by the cold process I have found free sulphur to be present.

From a piece of rubber-covered cloth I separated the rubber and submitted it to analysis by mixing it thoroughly in small pieces with pure sodium carbonate and igniting, then dissolving the whole in water, and adding to it peroxide of hydrogen previously treated with excess of barium chloride (to separate sulphuric acid or sulphates.) The peroxide ensures the conversion of the lower oxides of sulphur into sulphuric acid, whilst the excess of barium chlorides precipitates the sulphuric acid in the solution, which is then weighed as barium sulphate.

Another portion of the made-up solution was neutralized and the chlorine present titrated. The rubber previous to ignition, as above described, had been well boiled in water and dried to separate any hydrochloric acid which might be present, but only a faint trace of chlorine compound could be thus separated from the rubber.

The total sulphur present in the rubber amounted to 2·60, and the total chlorine to 6·31 per cent.

The yellow-colored sulphur protochloride is best adapted for vul-

canizing because it does not act too strongly upon the rubber, whilst the dark colored chloride of sulphur, containing, as it does, a large quantity of the higher chlorides of sulphur, is liable to render the rubber quite hard by vulcanizing it too much. The theory generally adopted to explain this is, that these higher chlorides break up easily, liberating their sulphur, which thus combines in greater quantity with the rubber; but my experiments and analyses prove that it is chiefly the chlorine and not the sulphur of the chloride of sulphur which produces the vulcanization.

A rubber substitute much used at present is produced by acting on vegetable oils, such as rape, linseed, etc., with a mixture of chloride of sulphur and bisulphide of carbon. The oil becomes converted into a solid substance resembling india-rubber to some extent, but being much more brittle. This body is now used in large quantity for mixing with india-rubber for the purpose of cheapening its production. On analysis of some samples of this material I have invariably found that it contained a much greater proportion of chlorine than of sulphur, and this process, therefore, is a vulcanization by chlorine rather than by sulphur.

Recently I analyzed three samples of rubber substitute, the one termed "special," another "spongy" india-rubber substitute, the third being similar to the first in appearance. The first contained of sulphur 3·4 and of chlorine 7·6 per cent.; the second contained of sulphur 4·56 and of chlorine 8·22, and the third 2·67 of sulphur and 7·90 of chlorine per cent.

These rubber substitutes contain considerable quantities of oily matters soluble in ether, which I have also found to be chlorine and sulphur compounds of the oils. The first yielded 20·0 per cent., the second 14·3, and the third 11·5 per cent. of these thick oily matters soluble in ether. This oily substance from the first sample contained 2·6 per cent. of sulphur and 6·1 per cent. of chlorine, whilst that from the second contained 2·97 and 6·87 per cent. of sulphur and chlorine respectively.

Some rubber manufacturers regard this oily matter as injurious to the rubber and reject any substitute which contains any considerable proportion of it. I have found, however, by experiment that this oily compound instead of acting injuriously on india-rubber, actually acts as a preservative of it; some rubber threads were smeared with this oily extract, some with ordinary (unvulcanized)

rape oil, and some left untreated: these were put into an incubator at 150° F. for a few days, when it was found that the oil-treated rubber was quite soft and rotten, whilst the other two had remained sound; after a few days more, the original rubber threads had become quite rotten, whilst the threads smeared with the oily part of the vulcanized oil remained quite sound.

The first and second samples of rubber substitute were examined for soluble chlorides or hydrochloric acid, by boiling in water; the first gave 0·18 per cent. of chlorine soluble in water, and the second 0·05 per cent.

It has been known for some time that copper salts exert a most injurious influence on india-rubber; copper salts are sometimes used in dyeing cloths which are afterwards employed for water-proofing with india-rubber, and it seems quite astonishing what a small amount of copper is required to harden and destroy the rubber, and the destructive effect of copper is further enhanced if the cloth contains oily matters in which the copper has dissolved.

As an example, here is a piece of cloth alleged to have damaged the thin coating of india-rubber on it: I found it to contain copper, and with a view of demonstrating this point, I took one piece in its original condition; to the end of this I pasted a similar piece of the cloth from which the oily and greasy matters had been removed by ether, and to the end of this again I pasted another piece of the same cloth from which I had removed both oily and greasy matters and copper; these three pieces joined end to end into one were then coated in the usual way with india-rubber, and then hung in an incubator at 150° F.; in the course of a few days the rubber on the original cloth had become soft, and it then hardened and became rotten and useless; the second piece from which the greasy matters had been removed then became quite hard and rotten, whilst the part from which both greasy matters and copper had been removed has remained in a perfectly elastic and good condition.

Professor Dewar observed accidentally that metallic copper when heated to the temperature of boiling water in contact with the rubber exerted a destructive effect upon it. With a view of finding whether this was due to the copper *per se* or to its power of conducting heat more rapidly to the rubber, I laid a sheet of rubber on a plate of glass and on it placed four clean discs, one of copper, one of platinum, one of zinc, and one of silver; after a few days in an incubator at

150° F., the rubber under the copper had become quite hard, that under the platinum had become slightly affected and hardened at different parts, whilst the rubber under the silver and under the zinc remained quite sound and elastic. This would infer that the pure metallic copper had exerted a great oxidizing effect on the rubber, the platinum had exerted a slight effect, whilst the zinc and silver respectively had had no injurious influence on it. A still more curious result was this, that the rubber thus hardened by the copper contained no appreciable trace of copper; the copper, therefore, presumably sets up the oxidizing action in the rubber without itself permeating it.

I have pleasure in acknowledging the assistance rendered to me in this investigation by my assistant, Mr. Frederick Lewis.

THE ALCOHOL TEST FOR PURE CASTOR OIL.[1]

By J. Arthur Wilson.

Castor oil differs in many respects from most fixed oils, especially in consisting largely of the glyceride of ricinoleic acid, which is soluble in absolute alcohol. Hence this reagent can be used for the detection of impurities in castor oil. Like most other tests of a similar kind, it is not of much use for the detection of small quantities of foreign oil, owing to the solvent action of the dissolved castor oil on the small proportion of foreign oil that may be present.

The British Pharmacopœia directs that pure castor oil shall be soluble in an equal measure of absolute alcohol and twice the measure of rectified spirit.

According to Mr. Allen ("Commercial Organic Analysis," vol. ii, 128) this is correct at 30° C., providing spirit of exactly 0·838 gravity be used. I have examined a number of samples of both commercial and medicinal castor oil, strictly at 30° C., and by a spirit of exactly 0·838 specific gravity, and find that at exactly 30° C. the oil is not completely soluble, but that the temperature of solution varies between 38° and 43° C. I may say that the oils I used satisfied all other requirements as to purity.

In carrying out the alcohol test, it is best to operate as follows: One measure of the castor oil under examination is mixed thoroughly with two volumes of spirit of exactly 0·838 specific gravity, and then

[1] *Chem. News*, Oct. 31, 1890, p. 215.

heated, stirring well with the thermometer till complete solution. In the case of genuine castor oil this will be between 38° and 43° C., possibly lower than the former; whilst if any foreign oil be present, the temperature will be much higher; and in gross adulteration, some oil may not be dissolved even at the boiling point of the mixture.

TOTTINGTON, Oct. 20, 1890.

DEXTROCOCAÏNE.[1]

BY A. EINHORN AND A. MARQUARDT.

According to Einhorn's formula for cocaïne, two asymmetrical carbon-atoms are present in the molecule; if this is correct, similar optical isomerides should exist to those of atropine. Experiments made to convert cocaïne directly into an isomeric base have not been attended with success, but similar experiments with ecgonine, one of its decomposition-products, have given the desired result, for this compound and all its derivatives, including cocaïne itself, are converted into dextro-ecgonine by warming with an aqueous solution of potassium hydroxide on the water-bath.

The best material for the preparation of dextro-ecgonine is the mixture of alkaloids obtained as a bye-product in the preparation of cocaïne, which must be warmed with the aqueous potash for 18–24 hours. Dextro-ecgonine, $C_9H_{15}NO_3$, crystallizes in tables which seem to be hemimorphous, and melts at 254°. On heating with acetic acid saturated with hydrogen chloride, it yields the same anhydroecgonine as is obtained from ordinary ecgonine, whence it would appear that the optical activity is due to the asymmetrical carbon-atom in the side chain. The *hydrochloride*, $C_9H_{15}NO_3,HCl$, crystallizes from alcohol in monoclinic prisms; an aqueous solution containing 4·4 per cent., in a tube 2 dcm. in length, rotated the plane of polarization 1·6° to the right. The *aurochloride*, $C_9H_{15}NO_3,HAuCl_4$, forms small, yellow plates, which melt with decomposition at 220°. Its *methyl ether*, $C_{10}H_{17}NO_3$, obtained by suspending dextro-ecgonine in methyl alcohol, and passing in hydrogen chloride, crystallizes from alcohol in prisms melting at 215°.

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[1] *Ber.*, **23**, 468–474 and 979–988. Reprinted from *Jour. Chem. Soc.*, June and August, 1890.

Dextrococaïne is prepared by heating the foregoing methyl ether with benzoic chloride. It is an oil, which gives a beautifully crystalline *hydrochloride*, $C_{17}H_{21}NO_4$,HCl, melting at 205°, whereas ordinary cocaïne hydrochloride melts at 181·5°. A solution of 1·9 per cent. of this salt in dilute alcohol of the same strength as employed by Antrick (Abstr., 1887, 506), in a tube 2 dcm. in length, rotated the plane of polarization 1·5° to the right. The physiological properties of dextrococaïne are similar to those of cocaïne, but its action takes places more quickly, and is more transient.

The authors suggest that the "methylcocaïne" and "methylecgonine," prepared by C. Liebermann and F. Giesel from mother liquors obtained in the manufacture of cocaïne, are really dextrococaïne and dextroecgonine, which are formed by the action of an alkali on ecgonine during the evaporation of the mother liquors. For the better characterization of the compounds, a number of new derivatives have been prepared. Dextrococaïne is best separated from ordinary cocaïne by means of the hydrochloride. The aurochloride of dextrococaïne, $C_{17}H_{21}NO_4$,$HAuCl_4$, is deposited from dilute alcohol in small, lustrous, yellow crystals melting at 149°. The platinochloride is very insoluble in water; it crystallizes from dilute alcohol in pale-yellow, slender needles which melt at 218°. The hydrobromide is obtained from hot water in the form of long, prismatic needles. The iodide and nitrate crystallize in lustrous leaves; both they and the sulphate are sparingly soluble in water. Dextrococaïne is liberated from its salts by the action of sodium hydroxide; it is at first obtained as an oily liquid, which readily solidifies on adding a crystal of the substance; it crystallizes in prisms melting at 43–45°. Benzoyl dextroecgonine hydrochloride, $C_{16}H_{19}NO_4HCl$, is formed by heating dextrococaïne with water for 48 hours; the solution is freed from benzoic acid by shaking with ether, and the hydrochloride precipitated on addition of hydrochloric acid; it crystallizes from water or alcohol in needles, or in short, broad, well-developed crystals melting at 244–245°. The *aurochloride* of *ethyldextroecgonine*, $C_{11}H_{19}NO_3HAuCl_4$, is deposited from dilute alcohol in orange-colored crystals melting at 115°. The corresponding propyl compound has a similar appearance and melts at 132°. The isobutyl compound, $C_{14}H_{23}NO_3$,$HAuCl_4$, crystallizes in orange-colored, transparent leaves melting at 130°. The aurochloride of amyldextroecgonine is at first oily, after some time it solidifies and

crystallizes from absolute alcohol in yellow prisms melting at 152°. Ethereal salts of benzoyldextroecgonine are formed by the action of benzoic chloride on the above ethereal salts. *Ethylbenzoyldextroecgonine*, $C_5H_7NMe{\cdot}CH(OBz){\cdot}CH_2{\cdot}COOEt$, crystallizes from ether in white prisms melting at about 57°. The hydrochloride is deposited from hot water or absolute alcohol in transparent triangular leaves melting at 215°. *Propylbenzoyldextroecgonine hydrochloride* crystallizes from water or alcohol in white prisms melting at 220°. The hydrochlorides of the corresponding *isobutyl* and *amyl* compounds crystallize in interlaced needles melting at 201° and 217° respectively. *Amylbenzoyldextroecgonine hydrobromide* is comparatively insoluble in water, and crystallizes in white leaves. The above salts are all dextro-rotatory, and have a physiological action similar to that of cocaïne. The authors have prepared a fresh specimen of dextroecgonine, from methyldextroecgonine; on recrystallization from methyl alcohol it melts at 257°, instead of 254°, as previously given; Liebermann and Giesel found 264° as the melting point of their "methylecgonine."

COMPOSITION OF DIGITONIN.[1]

By H. Kiliani.

According to Schmiedeberg, commercial digitalin contains, in addition to digitoxin, its most important pharmacological constituent, three glucosides, namely, digitonin, digitalin and digitaleïn, the first in greater amount, and when heated with dilute acid, it yields a substance which reduces Fehling's solution, and also a crystalline compound insoluble in water, which he named digitogenin. The author dissolved 1 part of commercial digitalin in 10 parts of water, added 1 part of concentrated hydrochloric acid (sp. gr. 1·19), and heated the mixture for six hours on the water-bath. By this means, a solution and a light-gray precipitate were obtained. The solution contained about equal quantities of two glucoses, which were identified by means of the melting points of their osazones and their behavior when oxidized, as galactose and dextrose, respectively. The precipitate of digitogenin was crystallized from alcohol, and found to be rather more than equal in amount to either of the two glucoses. It has the constitution $(C_5H_8O)_x$, probably $C_{15}H_{24}O_3$.

[1] *Ber.* **23**, 1555-1560. Reprinted from *Jour Chem. Soc.*, Sept., 1890, p. 996.

Digitonin has, therefore, very probably, the composition $C_{27}H_{44}O_{13}$, and its hydrolysis is expressed by the equation—

$$\underset{\text{Digitonin.}}{C_{27}H_{44}O_{13}} + 2H_2O = \underset{\text{Digitogenin.}}{C_{15}H_{24}O_3} + \underset{\text{Galactose.}}{C_6H_{12}O_6} + \underset{\text{Dextrose.}}{C_6H_{12}O_6}.$$

This would require a ratio of 1·4 : 1 : 1 between the weights of digitogenin, galactose and dextrose formed; that actually found is more nearly 1 : 1 : 1; but it must be remembered that at the moment of hydrolysis digitogenin is much more easily attacked than galactose and dextrose, and very readily yields resinous products. An analysis of the raw material agreed well with the formula $C_{27}H_{44}O_{13}$; not so, however, did Schmiedeberg's analysis.

Digitogenin.—The following details may be added to Schmiedeberg's data regarding this substance. One part requires for solution 35 parts of boiling or 100 parts of cold 93 per cent. alcohol, and 20 parts of boiling or 30 parts of cold chloroform, and 30 parts of cold glacial acetic acid; it is insoluble in water and aqueous alkalies. It seems to form a compound containing chloroform of crystallization, which loses its chloroform only very slowly at 110°. With alcoholic potash, it forms a crystalline potassium compound, strongly alkaline, and little soluble in alcohol. It forms no stable compounds with barium hydroxide or phenylhydrazine, but is attacked by mineral acids and oxidizing agents.

ON THE POISONOUS ACTION OF SULPHUROUS ACID AND ITS SALTS.[1]

By Dr. L. Pfeiffer.

Divergent opinions have been expressed as to the toxic action of the sulphites. Some have found them well borne in large and continuous doses, and cases have been recorded in which from 200 to 600 grains have been given without evil effects following. On the other hand, full doses have in some cases caused sickness, diarrhœa and general digestive disturbance, and P. Polli and Faralli noticed general relaxation of the muscles and weakness follow from their use. Pfeiffer points out that the commercial sulphite always contains a considerable portion of sulphates, and thinks this accounts to a certain extent for the different effects of the sulphites which have been recorded.

After a history of the results obtained by previous observers, he

[1] *Archiv f. Exper. Path. und Pharm., xxvii;* reprinted from *Med. Chronicle,* October, 1890.

gives an account of the experiments he has made to ascertain the exact effects of pure sulphite of sodium, and the conclusions he has arrived at with regard to the action of this salt and of sulphurous acid. He finds that the sulphites exert a distinctly poisonous action on both cold and warm-blooded animals, but they are so rapidly changed into sulphates that, unless very large doses be given, a sufficient amount of unchanged salt is not present to produce a poisonous effect. 96·5 per cent. of sulphite of sodium given appears in the urine as sulphate. When large quantities are administered, 85·8 per cent. passes out in five hours—the maximum excretion of both sulphate and sulphite taking place in the second and third hour, but more sulphite being excreted in the third hour. By the fourth hour, all the sulphite has been converted into sulphate. The digestive disturbance which has been found by some to follow the medicinal use of sulphites is probably due to the sulphurous acid set free by the acid of the stomach.

In man, small quantities in the air breathed (under ·5 per 1,000) cause spasm of the glottis and cough ; and prolonged respiration of air containing a very small proportion of the gas will at times give rise to chronic catarrh and inflammation of the respiratory organs.

Watery solutions of SO_2 produce a marked and extensive caustic effect. A solution of ·5 to 1 per cent. causes excessive and extensive gastritis, and a 5 per cent. solution corrodes deeply when injected into the stomach of animals, causing death in three to five minutes. It has distinctly a more marked effect than sulphuric acid, of which solutions of from 1 to 20 per cent. are not invariably fatal under similar conditions.

It is easy to understand therefore that, though the sulphites themselves may be without influence on the gastro-intestinal mucous membrane, the sulphurous acid given off, owing to decomposition in the stomach, may lead to catarrhal condition, sickness and diarrhœa. Bernatzik noticed this effect after doses of from 15 to 60 grs. of various sulphites, and also after solutions of sulphurous acid, and Pfeiffer himself, after taking only 7½ grains of sulphite of sodium, suffered from pain, discomfort and eructations. Sulphurous acid, like other acids, can be shown, experimentally, to interfere with the action of ptyalin and trypsin, but not with that of pepsin; but the sulphites probably have no other effect on digestion than that of interfering slightly with its rapidity.

Pfeiffer concludes by pointing out that sulphites are sometimes added to wine in such quantity as to be capable of producing injurious results. Kämmerer, in 80 specimens of wine examined, found 16 in which sulphites (from ·0017 to ·0093 per cent.) had been added.

List detected sulphites in a large number of French wines, the amount varying from ·0009 to ·0135 per cent.

Since ·08 gm. of SO_2, even when much diluted, will cause irritation of the digestive organs, the presence of sulphites in wine may be injurious if it contain a greater quantity than ·08 gm. in the litre.

The addition of wine to conserves may also be productive of unpleasant effects on the digestion.

PHARMACY IN THE SOUTH.

By Harry Vin Arny, Ph.G.

Read at the Social Meeting of the Alumni Association, Philadelphia College of Pharmacy, November 13th.

As an introduction, permit me to say that this paper could be termed, with more propriety, "Pharmacy in New Orleans," it being a view of pharmacy taken from a stand-point solely Orleanian. But, as New Orleans is the leading city of the South and most thoroughly Southern, it can, perhaps, be regarded as typical.

The general aspect of Pharmacy in the South is about the same as that in the North; the Southern pharmacist partaking of the same annoyances and worries, obtaining the same benefits and making about the same living as does his Northern brother. It is only in local coloring—the stage-setting and *dramatis personæ*, as it were—that there is any noticeable difference, and it is this phase upon which I will chiefly expatiate.

As to general aspects, suffice it to say that in this city of 241,000 inhabitants there are four wholesale and 155 retail drug-stores, giving occupation to 382 registered persons, whose respective abilities range along the whole gamut of excellence, from good to bad. The average is not as high as in Philadelphia—a natural sequence to the lack of proper facilities for pharmaceutical education which has heretofore existed in this community. But the want has been filled; the Pharmaceutical Department of Tulane University, while still an infant, is a lusty one, and its class of 1890 was a body of young men as well trained in pharmaceutical knowledge as any similar class in the country; so we soon will have attained as high an average as anywhere else in the country.

The prevailing prices for medicinal commodities are about the same as in the North, but the cutting on proprietary articles is not so prevalent. We are fortunate in possessing in this State a just and satisfactory pharmacy law, enforced by a conscientious and intelligent Board.

For the information of those students thinking of settling down this way, I will say that the diplomas of the P. C. P. are recognized, as well as those from all other reputable Colleges.

It is the odd customs peculiar to this place that make it so charming a stopping-place to the Northern tourist, it seeming to such a foreign country. Its large, airy houses, its lovely rose gardens, its peculiar and far-famed institution, the Carnival, are too well known for description here (besides not entering into the subject of this paper); but the odd customs extend also into the province of pharmacy, and of them the most peculiar is the institution known as Lagniappe (pronounced Lan-yap). Lagniappe is something given to the purchaser in a retail store, a bribe to secure his future patronage. It is a custom extending back to time immemorial, its origin being accounted for by the following legend, which is given for what it is worth: Years ago, in the old French Quarter, there lived an old lady who had, as a pet, a monkey, glorying in the high-sounding name Lagniappe. The monkey was a well-known character in the neighborhood, and had a decided taste for sweet things; so, when the old lady went to market or to the grocery or drug-store she would always ask for an orange, cake or candy, "for Lagniappe." Then the children in the neighborhood took it up, although, it is feared, the monkey obtained but a small portion of the good things given "in his name," for, after he had been gathered to his fathers, and even to this day, we are asked to give gum and candy "for Lagniappe." The custom is so firmly fixed, that there seems no danger of its ever being abolished, despite the opposition of store-keepers. It is a practice entailing considerable expense upon the merchant, personal observation showing that in our establishment the cost of Lagniappe daily given away is about one to two per cent. of the gross sales. Still, there is no objection to humoring the children; but when a man buying five cents' worth of Castor Oil wants "Lagniappe" for the baby, or a greasy urchin says "gimme Lagniappe" after paying ten cents for five two-cent postage-stamps that have been neatly wrapped up for him, it seems time to call a halt.

Then the negro—that never-failing source of interest and amusement to a student of human nature. Not the indolent, insolent young ones, born since the war, and given just enough education to ruin them; but the respectful, illiterate, ante-bellum negroes, with their quaint ways and quainter sayings. Alas! they are a type fast passing away.

The old-time negro is well-learned in "yarbs," and, coming to the drug-store for such panaceas as Sampson Snake Root, Jimson Weed and Dogwood, regards the presiding genius of the place with the same degree of awe and respect as was accorded the alchemists by the ancients.

Then, too, the drug-store is invested with an air of magic to them, as it is the repository of infallible Voodo charms. Voodooism is a relic of African barbarism, not entirely eliminated even by centuries of Christian influence. Almost every old-time negro is a firm believer in black art, in charms, and in philters (not the kind of which Professor Remington has told you, but those exerting potent influence upon the affections). Superstition remains in spite of all. Chief among the voodo charms is Lodestone with a little steel dust; "She Lodestone" is preferred, the difference in gender being entirely unaccountable to me.

Next in "saving grace" comes Grains of Paradise, those pungent seeds coming to us from Guinea, popularly supposed to possess almost as much virtue as a grave-yard rabbit's ear; and of these three great charms at least one can be found in the pockets of every old-time negro.

We are spared one annoyance of the Northern pharmacist by the disuse of pennies—coins which are almost entirely tabooed here. Efforts have been made by some of our merchants (for what reason is beyond my ken) to introduce them, by pricing their goods at figures whose units are some other than five or naught; but their efforts have been of small avail, as the ladies have voted coppers an annoyance, immediately exchanging them for postage stamps or some penny device. In ordinary business transactions, the penny never enters into the question, twenty-six or twenty-seven cents being settled at twenty-five; twenty-eight or twenty-nine cents at thirty cents.

Up to recently, we never accepted pennies at our establishment, but the introduction of chewing-gum in penny packages gave rise to a slight demand on the part of some thrifty urchins for that commodity in centesimal quantities, which is rather unwillingly granted, as we are as conservative regarding the innovation of coppers as are other Southerners.

We have three denominations of currency in use here that are not known in Eastern commerce—the "quartee," the "picayune" and the "bit."

The "quartee," a denomination original to, and used only in, the French quarter, represents two and a half cents of United States currency, and the term is used in the absence of pennies by those so poor as to desire their nickel to go as far as possible. Such, entering a store, will ask for a "quartee" of this and a "quartee" of that, giving a five-cent piece in payment.

Two "quartees" make a "picayune," a term used to express the value of five cents, and in universal use in this city, one of our leading dailies being so called. Both Webster and Worcester state that a "picayune" is worth six and a quarter cents, a statement perhaps true in other sections of the country, but not so here.

The last imaginary denomination of our currency is the "bit," value twelve and a half cents; and if, on purchasing a box of Blank's Pills, you are told they are worth "two bits," don't be surprised, but hand out your silver quarter.

Such are some of the oddities of the drug trade in our well-beloved Crescent City, the city which has been accorded the honor of entertaining the American Pharmaceutical Association next May. I advise all who can possibly do so to take advantage of the opportunity of visiting New Orleans in the month in which she is most gorgeous, ensuring them a hearty Southern welcome and a very pleasant stay.

MINUTES OF THE PHARMACEUTICAL MEETING.

PHILADELPHIA, November 18, 1890.

On motion, Mr. Alonzo Robbins was asked to preside.

The minutes of the last meeting were read and approved.

The Registrar announced that the Index Catalogue of the Library of the Surgeon-General of the United States had been presented by Dr. John S. Billings, of Washington; and the Jahresbericht für Agricultur-Chemie had been received for the library.

Professor Maisch read a paper, written by Gustavus Krauss, Ph.G., of Memphis, Tenn., upon *Solanum carolinense*, commonly known as horse-nettle, from the spines with which it is covered. The plant has recently attracted some

attention as a remedy in convulsive diseases (see AMER. JOUR. PHARM., 1889, p. 552).

Professor Trimble read a paper upon the California soap plant, the *Chlorogalum pomeridianum*, and exhibited specimens of the bulb. Reference was made to the bulbs preserved in the College Cabinet, donated by Mr. J. J. Brown thirteen years ago; also to the uses of the bulbs as described in previous volumes of the AMERICAN JOURNAL OF PHARMACY (1877, p. 569, and 1878, p. 589).

A paper upon *tests for the hypophosphites* was read by F. X. Moerk, Ph.G. In the discussion which followed, reference was also made to certain organic substances, like arbutin, which produce, in alkaline solution, with phosphomolybdic acid, a blue color similar to that described in the paper.

Mr. Moerk also read a paper upon the *detection of silver salts* in the presence of mercurous salts, and stated that he had not seen any notice of the power of the mercurous salts to prevent the usual reaction of the former with hydrochloric acid and ammonia.

Mr. C. A. Heinitsh exhibited a specimen of Java Cinnamon which he had obtained from a wholesale dealer in spices in this city; the similarity of the flavor and odor to that of Ceylon Cinnamon was quite remarkable. Professor Maisch said that Cinnamomum zeylanicum had been cultivated in Java, and that the bark was sometimes sent into the market deprived of the corky layer, so as to resemble Ceylon cinnamon in appearance. Reference was also made to some varieties of cinnamon which are held in high esteem by the Chinese (see this Journal, October, p. 497), and some of which may be procured in this country from Chinese merchants.

The papers were referred for publication, and the meeting adjourned.

EDITORIALS.

The Decennial Index for the last ten volumes of THE AMERICAN JOURNAL OF PHARMACY is in course of preparation, but it cannot be completed for some weeks to come, and will probably not be ready for issue for several months. In this connection, we desire to extend our thanks to our contributors, as well as to our readers, and to bespeak for the JOURNAL a continuance of their friendly and valued interest, and a further extension of its influence and usefulness.

The California College of Pharmacy holds its sessions during the summer months. Its eighteenth annual commencement took place at San Francisco, October 28 last, when the degree of Ph. G. was conferred upon 15 successful candidates by the President of the University of California. Addresses were made by President Melvin, of the California Pharmaceutical Society; by H. E. Highton, Esq., by Professor Runyon, and by B. A. Mardis, of the graduating class. Two prizes were awarded, a gold medal to Stephen Cleary, and a microscope with attachments to John V. Leithold.

The Detroit College of Medicine has organized a *Department of Pharmacy*, in which lectures are to begin early in January. Michigan has already a well-equipped and well-known Pharmacy School connected with the State University at Ann Arbor.

Tablets of Potassium Chlorate and Ammonium Chloride.—The notice in our August number, reporting the spontaneous detonation of tablets of the com-

position indicated has directed attention to other cases of the spontaneous decomposition of a mixture of the two salts. It is very likely that the first step in the reaction is the mutual interchange, wholly or in part, of the acids and bases, resulting in the formation of potassium chloride and ammonium chlorate. The latter salt is readily decomposed under the influence of a slightly elevated temperature yielding chlorine, nitrogen and various compounds, and its spontaneous detonation was noticed by Mitscherlich fifty years ago. But we desire more especially at the present time to direct attention to the tablets mentioned as the probable cause of some mysterious fires.

We have before us a special report dated October 24, 1890, made by Inspector Wm. McDevitt to the Philadelphia Fire Underwriters, in which the origin of a fire which occurred in this city, September 15, in the laboratory of Mulford & Co., is attributed to the accumulation, upon heated steam pipes, of dust from a mixture of potassium chlorate and sugar; and in regard to another fire, on October 15, following an explosion, the cause of which was not ascertained, it is stated that the firm, at times, had made tablets of potassium chlorate and ammonium chloride. The report further says, that "in September, 1881, your Inspector witnessed the remains of a fire in the store of Wyeth & Brother, on West Walnut Street; the fire having originated among a mass of tablets composed of chlorate of potash and muriate of ammonia; from which, owing to timely discovery, only a small loss resulted."

These observations have furnished, among others, a clue to a mysterious fire which occurred in the store of Finlay & Brunswig, New Orleans, January 23, 1889, which was effectually extinguished by the gases generated from the chemicals near the point of ignition. In view of the importance, to apothecaries and druggists, of the subject, we copy the details from a communication by John E. Whiting, to "The Standard," of November 15, 1890, published at Boston; these details are as follows:

"We found that the fire had originated on a high shelf which contained the following articles, viz: some tin boxes filled with carbonate of magnesia, several glass bottles containing chlorate of potash and muriate of ammonia tablets; a wooden box containing carbonate of magnesia and a paper bag containing finely ground anise seed on top of the above-named wooden box, while the shelf above was filled with bottles of calcined magnesia. The fire apparently originated on top of the wooden box; as the fire had burned a hole through the cover at one end and had run along the edge of it and spread down the end and one side, and had burnt a portion of the paper bag and anise seed. The blaze had also burned a hole through the shelf above and charred a large portion of the under side of that shelf. The bottles containing the chlorate tablets were broken; while the heat had driven off the chlorine contained in them, as a dense vapor had adhered to the wooden ceiling of the room for quite a distance. It is very evident that the chlorine gases thus liberated had displaced the oxygen of the air to such an extent that they had actually smothered the fire; but the cause of the fire itself was, at that time, a mystery that none of us could solve."

Mr. Whiting now believes it to be "almost self evident that the innocent looking little chlorate tablets must be held responsible as the incendiary in this as well as in the other cases described, an explosion having taken place among

the tablets that set the paper bag containing the anise seed on fire, which continued to smoulder until extinguished by the chlorine gases."

The American Chemical Society will hold a general meeting in the University of Pennsylvania, West Philadelphia, December 30 and 31 next. All chemists, whether members of the Society or not, are cordially invited to be present and to take part in the proceedings. Chemical manufacturers and all persons interested in chemistry will be heartily welcomed at the meetings.

REVIEWS AND BIBLIOGRAPHICAL NOTICES.

The Student's Course in Pharmacy. A Series of Lectures for the Use of Drug Clerks and Home Students in Pharmacy. By W. H. Watson. Nashville, Tenn.: Franc. M. Paul, publisher. 1890. 16mo. pp. 312.

Essentials of Practice of Pharmacy, arranged in the form of Questions and Answers. Prepared especially for the Use of Pharmaceutical Students by Lucius E. Sayre, Ph.G., Professor of Pharmacy and Materia Medica of the School of Pharmacy of the University of Kansas. Philadelphia: W. B. Saunders. 1890. 12mo. pp. 179. Price, cloth, $1; interleaved, $1.25.

These two little works have made their appearance about the same time and are intended for the use of students, serving in the place of lecture notes, and as aids in reviewing the subject matters pertaining to pharmacy. Obviously, they are merely skeletons that may be utilized partly as a basis for studying theoretical pharmacy, but more especially for re-surveying the field previously gone over. They will both serve a useful purpose in the direction indicated, particularly if supplemented by as many experiments as can be made by the student with the means at his command. Suggestions in this direction might, we think, be incorporated, rendering the books still more useful than they will prove with the present scope. In some respects, a little more care bestowed upon the proof-reading would have prevented certain inaccuracies or inconsistencies; thus we find in the first-named work the plant names given indiscriminately with capital and small initial letters; and in the second work hydrochloric, instead of chloric acid is mentioned as an oxidizing agent, and the list of glucosides includes several principles not belonging to that class of compounds.

A Compend of Pharmacy. By F. E. Stewart, M.D., Ph.G., Demonstrator in Materia Medica and Pharmacy, Jefferson Medical College, etc. Third revised edition. Philadelphia: P. Blakiston, Son & Co. 1890. 12mo. pp. 171. Price, cloth, $1; interleaved, $1.25.

This quiz-compend has come to hand since the preceding notice was written. The little work is similar in scope and object to the two preceding ones, and is now in its third edition, a former one having been noticed in this Journal four years ago. The tables for converting U. S. weights and measures—customary to metric, and metric to customary—issued by the U. S. Coast and Geodetic Survey Office, have been published in an appendix, and will be found useful for reference.

Commentar zum Arzneibuch für das Deutsche Reich (Pharmacopœa Germanica, editio iii), mit vergleichender Berücksichtigung der früheren deutschen u. a. Pharmakopöen, von Dr. Bruno Hirsch, Apotheker in Berlin, und

Dr. Alfred Schneider, Korps-Stabsapotheker in Dresden. Göttingen: Vandenhoeck & Ruprecht. 1890.

Commentary to the German Pharmacopœia with references to, and comparison with, the former German and other Pharmacopœias.

This promises to become a very useful and practical as well as thoroughly reliable work. It is issued in parts of 64 pages each, of which two are now before us; they indicate all the good qualities which, on former occasions, we had the opportunity of commending in connection with several pharmaceutical works of one of the present authors. The work now under consideration opens with an introductory chapter giving a brief account of the new pharmacopœia recently published, and of its general features. Next follows a survey of the changes that have been introduced by the new pharmacopœia, tables being given showing the remedies newly admitted or dismissed; a long list recording the changes, verbal and others, which have been made in the text; and similar lists showing the changes in the official reagents, the recognized maximal doses, the specific gravities, and in the poisons and powerful medicines which have to be kept with special precautions. The following chapter describes in a succinct manner the most important operations required for the recognition and examination of the different articles, beginning with specific gravity and the manner of reducing heavy liquids to their proper densities; the determination of the melting and boiling points, and a brief account of the strength and uses of the volumetric solutions and of the limits of certain important reactions. The commentary proper enumerates the pharmacopœial articles in alphabetical order, as they are contained in the Pharmacopœia, and after giving the complete pharmacopœial text, proceeds with the comments, first giving the chemical formula and combining weight, after which the process of preparation is described, the nomenclature is explained if necessary, and the pharmacopœial requirements for determining the identity and purity of the remedy are discussed, followed by other reactions if deemed advisable or necessary, and by remarks on pharmaceutical uses, precautions for preserving the remedy, and similar practical points. Vegetable drugs receive a similar treatment; following the text of the Pharmacopœia, we find brief accounts of the parent plants, of the preparation of the drug for the market, of the constituents, reactions, impurities, substitutions, etc.

The work will, without doubt, be carried to completion in the same excellent manner in which it has thus far been rendered; and it should be mentioned yet that paper and typography are in keeping with the contents.

A Text-Book of Practical Therapeutics, with especial reference to the application of remedial measures to disease and their employment upon a rational basis. By Hobart Amory Hare, M.D. (Univ. of Pa.), B. Sc., Clinical Professor of the Diseases of Children and Demonstrator of Therapeutics in the University of Pennsylvania, etc., Philadelphia: Lea Brothers & Co. 1890. 8vo. pp. 632. Price, cloth, $3.75; leather, $4.75.

The author states that the object of the book is to provide the physician or undergraduate student of medicine with a reliable guide in the study of therapeutics, or the application of remedial measures for the cure of disease; and that it has been written because most of the text-books on this subject treat of it as if the student was already a skilled physician or experimental pharmacol-

ogist. The work is divided into four parts, of which the first discusses general therapeutic considerations, viz., the modes of action and of administering drugs; the dosage, absorption and duration of action of drugs; idiosyncrasy; indications and contraindications; and the combination of drugs for a joint effect. The second part treats of the various drugs, both officinal and unofficinal, which are arranged in alphabetical order of their English names, the salts being found under the names of their acids (bromide, carbonate, nitrate, etc.), except the preparations of iron, mercury, etc., which are considered in close succession. Under each head is usually found a brief characterization of the drug, its therapeutic properties and uses, and its administration, mentioning among the preparations also those of the British Pharmacopœia. Of the more important drugs, the physiological action is also discussed, more or less extendedly as their importance seemed to require, and in connection therewith treatment of poisoning, untoward effects, etc. In the third part, remedial measures other than drugs are described, such as *acupuncture*, cold, heat, venesection, etc.; also different foods for the sick, and diet lists for infants. Electricity, which would be looked for in this part of the work, has not found a place here, because its application in therapeutics has outgrown any work save one devoted to that subject alone. Part IV is headed "Diseases," and discusses the remedial and other measures available under varying conditions. Several prominent physicians have contributed a number of articles on diseases to which they have given special attention. A table of doses, an index of drugs and remedial measures, and an index of diseases and their treatment form the concluding portion of the book.

As will be seen from the foregoing, the field covered by the work is a large one, which has been well covered through the terseness and clearness of the statements. The care bestowed upon the book is also shown in the proof-reading, typographical errors being very few in number. Typography and the make-up in general are inviting.

Ointments and Oleates, especially in diseases of the skin. By John V. Shoemaker, A.M., M.D, Professor of Materia Medica, Pharmacology, Therapeutics and Clinical Medicine, and Clinical Professor of Diseases of the Skin in the Medico-Chirurgical College of Philadelphia, etc. Second edition revised and enlarged. Philadelphia and London: F. A. Davis, Publisher. 1890. 12mo. pp. 298. Price, cloth, $1.50.

This work is divided into two parts, treating respectively of Ointments and of Oleates. Each part opens with a comprehensive historical sketch of the introduction and use of the class of preparations, and of their application in diseases of the skin. More particularly are these subjects discussed in an elaborate manner in connection with the oleates, in the more general introduction of which, some twelve years ago, the author had specially interested himself, while Dr. Lawrence Wolff was experimenting upon their production, for pharmaceutical purposes, from the materials then accessible in the market. The book necessarily contains a large number of formulas, and Part I has been materially enlarged, as compared with the first edition, by the admission of the ointments recognized in the pharmacopœias of several European and American countries and by other authorities. During the printing of the book, the new (third) edition of the German pharmacopœia made its appearance, but has,

practically, made scarcely any change in this class of preparations, except that savine ointment was dismissed, and boric acid ointment was introduced. We should think that the comparison of the different authoritative standards would be greatly facilitated by printing their corresponding formulas together.

The work, in the preparation of which great care and extensive study is evident, will prove of great value not only to the practising physician, but also to the pharmacist, on account of the numerous recognized formulas and the many practical details which are of value in the manufacture of many of these preparations. It should be stated yet, that the work forms No. 6 in the Physicians' and Students' Ready-Reference Series of the same publisher.

The Physicians' Visiting List for 1891. Philadelphia: P. Blakiston, Son & Co. Price, for 25 patients, $1.

The present is the fortieth yearly issue of this useful Visiting List, the arrangement remaining substantially the same as has been found convenient in preceding years. The preliminary matter, including a number of useful tables, has been revised, and short instructions for the transportation of injured persons have been added. The list of new remedies for 1891 includes several older ones, like ethyl bromide, gurjun oil and pilocarpine, for which new applications have been found.

Pharmacographia Indica. A History of the Principal Drugs of Vegetable Origin met with in India. By Wm. Dymock, Brigade Surgeon, Bombay Army, etc.; C. J. H. Warden, Surgeon-Major, Bengal Army, etc.; and D. Hooper, Quinologist to the Government of Madras, Ootacamund. London: Kegan Paul, Trench, Trübner & Co. 1890.

It affords us much pleasure to announce the appearance of Part III of this valuable work, which constitutes the first half of the second volume. Myrobalans, cloves and other myrtles, colocynth and other cucurbitaceæ, and many drugs of the umbelliferæ, rubiaceæ, compositæ and orders allied to the foregoing are described in the part now before us. Many of the drugs noticed are also used here, some have become obsolete with us, while a much larger number is but little known in the western hemisphere, or even in Europe. Thus, Persian sagapenum is unknown in America, and is seldom used in India; that which reaches Bombay is mostly exported to London. The asafetida known as *hing*, which reaches India, is all consumed in that country, together with a considerable portion of that called *hingra;* the *stony* asafetida, which has occasionally found its way to the western world, seems to be made, so we are informed, more for convenience of carriage than for deception, and the juice of the plant is sometimes so fluid that it runs out upon the surrounding ground and becomes mixed with the sand. In regard to cinchona, we learn that in 1885 a bark yielding 3 per cent. of quinine sulphate would have been worth 1*s.* 9*d.* per pound; at the present time the same bark would not sell for more than 6*d.* The historical, statistical and other information given in connection with each drug is of very great interest; but we confess that we were somewhat disappointed in not finding any account of ipecacuanha, and from this must conclude that the cultivation of the plant in India has not been attended with success, a conclusion for which we were, in a measure, prepared from the reports published some years ago.

Grasses of the Southwest.—Plates and descriptions of the Grasses of the Desert Region of Western Texas, New Mexico, Arizona and Southern California. Part I. By Dr. Geo. Vasey, Botanist, Department of Agriculture. Washington: Government Printing Office. 1890.

This handsome publication contains fifty faithfully-executed lithographed plates, quarto size, of the grasses of the region indicated, and gives botanical descriptions of the species figured, together with information concerning special characteristics, the usefulness and the probable advantage to be derived from the cultivation of the plants as pasture grasses. A second part will complete the volume, and it is contemplated to publish, in a similar manner, illustrations of the grasses of the Pacific Slope.

Contributions from the U. S. National Herbarium. No. III. Issued November 1, 1890.

The pamphlet contains about thirty pages, descriptive lists of plants collected by Dr. Edward Palmer in 1890, in Lower California and Western Mexico, and examined by Dr. G. Vasey and J. N. Rose. A full-page plate illustrates a hitherto unknown composite plant, which has been named by the authors *Coulterella capitata*, in honor of Professor John M. Coulter, the learned botanist of Wabash College.

Chloralamid (Schering) the new hypnotic, discovered by Dr. J. von Mering. Published by Lehn & Fink, New York.

A pamphlet of forty-seven pages, containing papers on the use of this compound, republished or abstracted from German and American periodicals.

Revue International de Bibliographie médicale, pharmaceutique et vétérinaire, dirigée par le docteur Jules Rouvier, Professeur de clinique obstetricale et ginecologique, etc. Paris et Beyrouth (Syrie).

A pamphlet of 247 pages, appearing quarterly, and containing, systematically classified, the titles of essays on the above subjects, published in the different countries. A curious mistake has happened in the translation from the English and German of the titles of two papers on rosemary and oil of rosemary, the name of the plant being rendered in French *roses marines*, instead of *romarin*. Several other errors due to incorrect translation have been noticed; but these are insignificant in comparison with the faithful labor and evident care bestowed upon the collection and arrangement of the vast material. As will be noticed from the above, the publication is a classified index of the periodical literature, and aims at embracing all periodicals of the civilized world.

Twenty-first Annual Report of the State Board of Health of Massachusetts. Boston: 1890. 8vo, pp. lxx and 457.

This publication contains reports and statistics relating to the quality of food, drugs, milk, ice, etc., supplied in Massachusetts.

First Annual Report of the State Pharmaceutical Examining Board of Pennsylvania, for the year 1888. Harrisburg: 1890. 8vo. pp. 91.

The official report was handed to the Governor of the State July 17, 1888; but the usual delay in the printing of official documents is the cause of its becoming accessible in print fully two years after it has been rendered. It gives a statement of the moneys received and disbursed during the year, and lists of the

pharmacists and qualified assistants registered in compliance with the pharmacy law.

The following printed Proceedings of State Pharmaceutical Associations have been received:

New Jersey.—Twentieth annual meeting. pp. 95. See August number, p. 428.

Ohio.—Twelfth annual meeting. pp. 126. See August number, p. 428.

Wisconsin.—Eleventh annual meeting. pp. 79. See September number, p. 475. The report of the State Board of Pharmacy, which is issued with the Proceedings, occupies 37 additional pages.

OBITUARY.

Max A. J. Behrens died suddenly of heart-disease, October 4, at Helena, Montana, where he had carried on the drug business for some time past. He was born in Germany in 1853, and came to this country at the age of nineteen, when he settled in Chicago until he removed to Montana about three years ago.

William Lewis Turner died in Philadelphia, November 1, last, in the fifty-fifth year of his age. He was born at Baltimore, and losing his father when twelve years old, was compelled to partially take care of himself, and to supplement the limited schooling, received until then, by attending the night schools at the Maryland Institute, Lyceum and other public institutions. All through life he was fond of reading, and earnestly endeavored to add to his store of knowledge. He entered the retail drug business with Mr. A. Kennedy, at Tenth and Ogden Streets, Philadelphia, in 1857. Four years later he started in business for himself, and in 1864 he removed to Eleventh and Oxford Streets, where he remained until death. He was an occasional contributor to this and other journals, but during recent years he took a more active part in the effort to correct the evils besetting pharmacy, and to stay the baneful influence of the nostrum interest. His earnestness in this endeavor gained for him much influence in the Pennsylvania Pharmaceutical Association, whose presiding officer he was for the term 1887–88. He was a man of original thought, who had the courage of his convictions; and though the writer of the present notice was not unfrequently compelled to differ from his views, he never had occasion to question the sincerity of his opinions, or his integrity of purpose.

Notice of the death of the following graduates of the Philadelphia College of Pharmacy has been received:

Munroe Bond, class 1873, a native of New Hampshire, died in Philadelphia September 15, aged 38 years. He was engaged in the drug business and practised medicine, having graduated from the Jefferson Medical College in 1879. Two papers on fluid extracts, written by the deceased, were published in this Journal in 1873.

Frederick S. Booth, Ph.G., class 1883, died suddenly of heart affection, October 24, aged 30 years; he was in business at 326 East Girard Avenue.

John E. Cook, class 1873, died at Media, Pa., September 12, of hemorrhage of the lungs, aged 37 years. He was a mechanic of no mean ability, had paid much attention to botany, was for some years assistant to the chair of Botany and Materia Medica in the Philadelphia College, and at the time of his death held the chair of the same branches in the Powers College.

Benjamin H. Diehl, class 1881, died October 15, aged 32 years. He had also studied medicine, and at the time of his death conducted a drug store, in connection with the practice of medicine, near Broad and Cumberland Streets, in this city.

Amos Hansell, class 1858, died at the age of 53 years; for a number of years he had been in business at Twentieth and Market Streets.

Franklin Chapman Hill, class 1848, died of heart failure, after a protracted illness, at Princeton, N. J., on the 5th of November, 1890, in the 63d year of his age. He was born in the city of New York; his family removing to this city in 1835, he was educated in the school of the late Thos. D. James; learned the drug business in the store of Professor Edward Parrish, and afterward opened a store at N. E. cor. of Eleventh and Mt. Vernon Streets, Philadelphia. His uncle, who was President of Antioch College, Ohio, induced him to continue his studies there, and afterward at Cambridge, Mass., where his fondness for scientific problems drew him into civil engineering, with which he employed himself some time, both in private life and in the U. S. army during the late war. He became associated with Mr. Ward, of Rochester, who was much engaged in palæontologic work, and this started a new field of industry in which he greatly excelled; so well versed in entomology was he that the trustees of Princeton College purchased a collection of drawings made by him for their museum. He left a wife, 4 sons and 4 daughters, some of them engaged in scientific pursuits. The Trustees of Princeton College voted his salary to be paid up to January 1, 1891, in recognition of the value of his services to the museum of the College as curator. T. S. W.

John J. Lantz, class 1887, died in this city, October 7, aged 25 years. He was in business on Fairmount Avenue.

Harold D. Owens, class 1889, died at the age of 23 years, October 20, from injuries received October 15, at the fire, caused by an explosion of illuminating gas, at the factory of H. K. Mulford & Co., 2132 Market Street, this city.

VARIETIES.

Quinine pills are recommended by E. Sohet (*Bull. Soc. Roy. de Phar.*) to be made with lactic acid, of which three drops are stated to be sufficient to form a plastic mass with one gram of quinine sulphate. A somewhat larger quantity of the acid will be required in case other solid medicaments are to be incorporated. Since lactic acid is a normal constituent of the organism, its use for this purpose, in such a minute quantity, appears to be less objectionable than that of other acids.

Pyoktanin or *methyl-violet*, according to Liebreich (*Therap. Monatshefte*, July), is a mixture of aniline products of uncertain composition, which explains

the different results obtained from its use. In eye diseases, Braunschweig found it to cause great damage; Kolliker observed no benefit from it, and Mauthner considers it useless. *Victoria-blue*, which closely resembles methyl-violet, has no action on microbes whatever. See also this volume, p. 295.

Aletris farinosa as a Cathartic.—The rhizome is administered in the form of a powder, in doses of 0·6 gm., as a simple bitter tonic. In larger doses, it possesses cathartic, emetic and somewhat narcotic properties. It has been employed with good results in colic, dropsy and chronic rheumatism.—*Journal de Médecine*, September 7, 1890.

The diuretic action of milk sugar observed by Professor Sée (Am. Jour. Phar., 1889, p. 417) has been recently confirmed by Dr. Zawodski (*Deutsche Med. Ztg.*) who employed it in a severe case of dropsy, with excellent results; he made no change in the diet of the patient and allowed him to take fluids. The dose was from 12 to 18 grams a day, given with a considerable quantity of milk that contained at least 50 grams of milk sugar. The author thinks that this substance is to occupy a prominent place among the diuretics, as it is easily administered, agreeable in taste and of low cost.

Tellurate of potassium, according to *La Médecine moderne*, October 21, 1890, has been found by Neusser to be valuable in the suppression and diminution of night-sweats. He employs one-third of a grain, in pill-form. After the patients have taken this dose for a short time, it may be doubled without unfavorable results and with a good effect in reducing the quantity of sweat, provided the first dose has not been sufficient to control it. In rare cases, the drug may produce dyspeptic symptoms. As a general rule, however, it has a favorable effect.—*Medical News*, Nov. 1, 1890.

The Uses of Keratin.—Drs. Unna and Beirsdorff recommend that drugs which irritate the gastric mucous membrane, such as digitalis, squill, salicylic acid, iodide of iron, etc., be given in the form of pills coated with keratin, or in capsules of the same substance. Drugs which diminish the activity or which neutralize the acidity of the stomach, such as tannic acid, nitrate of silver, and alkalies, should be given in the same way. A coating of keratin is also desirable when prescribing drugs that are required to act on the intestinal mucous membrane alone, and is especially valuable in the use of drugs which are given for the purpose of destroying intestinal worms, but which, if introduced into the stomach in the ordinary way, are absorbed to such an extent as to cause toxic symptoms, or to reduce their germicidal activity. Keratin is obtained by treating shavings of horn with ether, alcohol and an acid. It possesses the peculiar property of being insoluble in the stomach, but freely soluble in the intestines.—*Lancet*, October 18, 1890.—See paper by E. Bourquelot in Amer. Jour. Phar., 1889, p. 421.

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